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Original Communications.

ARTICLE I.

MECHANICAL THERAPEUTICS, CHEMISTRY AND TOXICOLOGY OF MERCURY.

By S. V. CLEVENGER, M.D., Chicago.

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The simple mercurials depend for their medicinal properties upon the metal being finely divided, and in proportion to the extent to which this division is carried the therapeutic effects of the drug are augmented. A grain of mercury undivided has no medicinal value, but when separated into a hundred thousand globules and held by an excipient, as in blue mass, from forming large particles, the well-known effects of blue mass are obtained when taken in this form, and the more potent the pill the greater has been the division of the metal. The confections, oils, fats and other substances with which mercury in this state is blended by the pharmacist, impart nothing to it that changes its character. Though occasional oxidation may occur, it will be seen be-

ANNOUNCEMENTS FOR THE MONTH.

SOCIETY MEETINGS.

Chicago Medical Society—Mondays, March 1 and 15.

West Chicago Medical Society—Mondays, March 8 and 22.

CLINICS.

MONDAY.

Eye and Ear Infirmary—2 p. m., Ophthalmological, by Prof. Holmes; 3 p. m., Otological, by Prof. Jones.

Mercy Hospital—2 p. m., Surgical, by Prof. Andrews.

Rush Medical College—2 p. m., Dermatological and Venereal, by Prof. Hyde; 3 p. m., Medical, by Dr. Bridge.

Woman's Medical College—2 p. m., Dermatological and Venereal, by Prof. Maynard; 3 p. m., Diseases of the Chest, Prof. Ingals.

TUESDAY.

Cook County Hospital—2 to 4 p. m., Medical and Surgical Clinics.

Mercy Hospital—2 p. m., Medical, by Prof. Hollister.

WEDNESDAY.

Chicago Medical College—2 p. m., Eye and Ear, by Prof. Jones.

Rush Medical College—3:30 to 4:30 p. m., Diseases of the Chest, by Dr. E. Fletcher Ingals.

THURSDAY.

Chicago Medical College—2 p. m., Gynæcological, by Prof. Jenks.

Rush Medical College—3 p. m., Diseases of the Nervous System, by Prof. Lyman.

Eye and Ear Infirmary—2 p. m., Ophthalmological, by Dr. Hotz.

Woman's Medical College—3 p. m., Surgical, by Prof. Owens.

FRIDAY.

Cook County Hospital—2 to 4 p. m., Medical and Surgical Clinics.

Mercy Hospital—2 p. m., Medical, by Prof. Davis.

SATURDAY.

Rush Medical College—2 p. m., Surgical, by Prof. Gunn.

Chicago Medical College—2 p. m., Surgical, by Prof. Isham; 3 p. m., Neurological, by Prof. Jewell.

Woman's Medical College—11 a. m., Ophthalmological, by Prof. Montgomery; 2 p. m., Gynæcological, by Prof. Fitch.

Daily Clinics, from 2 to 4 p. m., at the Central Free Dispensary, and at the South Side Dispensary.

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low that this is of no consequence whatever. In three papers, read before the Chicago Biological Society, February 4th and March 3d, and the Microscopical Society February 27th, 1880, I detailed some experiments and observations, showing that mercury underwent no change in the system after ingestion, and that it was fully capable of producing all its therapeutical and poisonous effects by circulating in, or obstructing, the microscopic channels of the body. The first paper mentioned was published in the *Chicago Medical Gazette*, February 20th, 1880. In this article I shall endeavor to consolidate and formulate all the results obtained before and since that paper was published.

SIMPLE MERCURIALS.

1, Pilulæ hydrargyri; 2, unguentum hydrargyri; 3, hydrargyrum cum cretâ; 4, emplastrum ammoniaci cum hydrargyro; 5, emplastrum hydrargyri; 6, unguentum hydrargyri compositum; 7, linimentum hydrargyri; 8, suppositoria hydrargyri; 9, "oleate of mercury." The first eight are based directly upon globules of the metal ranging from $\frac{1}{500}$ to $\frac{1}{100,000}$ of an inch in size, mixed with substances more or less inert. No. 1 usually numbers 100,000 globules and upwards to each grain of mercury in the mass; No. 2 is much more finely divided. No. 3 is badly divided, some of the globules being quite large, as the chalk does not prevent confluence, and hence it is an unreliable form for administration. No. 9 contains very minute globules, reduced by the oleic acid from the yellow oxide, with which it is incorporated. The metal constantly precipitates from this form until very few globules are suspended in the oil. The other mercurials vary more widely in the quantities of mercury they contain, but none of them convey mercury into the system in any other than the metallic condition.

No other metal is capable of comparison with mercury in its mechanical properties and physiological effects. It is the only metal fluid at common temperatures, it resists separation into smaller masses and tends to form larger globules when divided, unless held apart by some substance that will coat each particle separately. Each minute sphere will adapt itself to the shape of the tubular structure through which it may pass, and will, by

virtue of its superior gravitating power, being fourteen times heavier than water, cleanse the tissues through which it circulates. The myriad globules released in the stomach and intestines are absorbed by glandular structures, blood vessels and lymphatics, and act as "alteratives" precisely as we could imagine a foreign body, having its weight and peculiarities, would act when introduced into circulatory channels. The distances between the globules prevent the larger sized masses from forming, and even when lying compactly an albuminous coating will effectually prevent cohesion until such covering is broken. I kept for a month a mass of globules shaken up in albumen, and found, after having given a dose to a frog, that the globules maintained their form in the tissues of the animal, and that only a few had run together by rupture of the enveloping albumen in the stomach, this being easily recognized by the larger sized globules and the silvery luster of the metal which the coating had previously dimmed.

H. C. Wood, p. 367, quotes Stille, Eld, Buchner, Cantu, Jourda, Andouard, Fourcroy, Gmelin, Byanon, Mayencon, Bergeret, Saikowsky, Oesterlin and Heller as authorities for mercury having been found in every conceivable tissue and fluid of the body. Naunyn in Ziemssen's Cyclopedia, p. 615, says: "It has been proved by the reports of good observers that mercury exists relatively very often in the bones in accumulations readily discernable by the naked eye, even many years after mercurial treatment. The metal has also been occasionally found in biliary calculi, as I can certify from my own observations." P. 616 he continues: If an albuminate is formed, "it must be again decomposed, for mercury is sometimes eliminated in urine which does not contain albumen. Frequently, however, we find the urine albuminous when it contains mercury. Besides, with the urine mercury is eliminated with the saliva, bile, fæces, and perhaps sweat. This elimination of the metal in the form of the finest globules has been observed in the urine, fæces and bile after inunction." Taylor on Poisons, p. 389, records that "globules recovered from brain and liver averaged $\frac{1}{2,600}$ of an inch, kidney globules were larger." Under a lens magnifying 70 diameters I was enabled to see what I have every reason to

believe was mercury in the blood vessels and lymphatic channels of the living frog. I saw it in a few instances in the act of exuding through the skin. Mr. E. B. Stuart, the secretary of the Illinois Microscopical Society prepared a number of slides showing the mercury globules embedded in the various tissues of frogs after I had given these animals various mercurial preparations.

The mechanical action of the divided metal has been overlooked, evidentally because the metal undivided and in large quantities had no such capabilities. Catalysis and other meaningless terms have been used to account for its workings, and for forty years assiduous search, without result, has been made for the mysterious soluble salt it was supposed to form in the body. Therapeutists committed to the bichloride theory of Mailhe, the black oxide theory of Jeannel, the albuminate theory of Sée, or the deoxidizing and reoxidizing theory of Odling, have the burden of proof resting upon them. Each has striven and utterly failed to prove that a salt is compounded from the metal in the system, and had either succeeded, the mystery would have been no less. The puzzle would only have been rendered more insoluble, for the next step would be to explain how their hypothetical compounds acted.

As water enters the city reservoir and issues from the thousands of hydrants as water, he who claimed that, although water enters and flows from the pipes, it is changed into something else in those pipes before its exit, would be bound to demonstrate what that something was. Mercury enters the body and leaves it plainly as mercury, but it is not mercury that acts, it is something else, and when you ask what is that "something else" they cannot tell you, nor demonstrate any of their guesses. Cut open the water mains and all their ramifications, and water is still there. The bodies of mercurialized animals have been repeatedly opened, and mercury has still been found in the various organs en route toward excretion or dormant in tissues. But he who favors the mechanical theory is still asked to prove that the mercury is utterly unchanged and that none of it is reduced to another condition. It cannot be done, nor is it necessary that it should be done, for it would be a profitless and impossible task to recover, globule for globule, every atom of mercury from tissues

after medication. The greater part of the mercury is recoverable, as metal, and the weight of probability is in favor of the supposition that mercury acts as mercury, and as nothing else. It is, however, incumbent to prove how minute particles of mercury, granted as circulating in the body, can produce all their therapeutical and poisonous effects. Granting the entrance of these globules to the tubules, what would be the most probable consequence? Propelled through such parts a deobstruent action, the removal of less weighty accumulations would inevitably follow. The functions of vessels thus restored must be accelerated, absorption, resolution, secretory processes and often hypersecretion be induced by opening minute bodily passages previously non-operative from active or passive causes.

Salivation may be produced by accumulations of the metal in the terminals of the dental arteries, a condition favored by the bony covering of these arteries and their relationship with the carotids. The minute globules would find easier ingress to than egress from the dependent portion of the lower jaw bone, and accumulation in the cancellated tissue, gums and salivary glands would account for ptyalism. Mercurials load the circulation and emunctories with effete matter because of their deobstruent effects and ability to insinuate their particles among all tissues, separating the morbid and ulcerated portions from the healthy by the great and universal law of heavy bodies acting in the line of "least resistance." Wound healing is interfered with by these foreign bodies opposing plasticity.

In great or long continued doses the metal would gather in certain areas, and, by occlusion of channels, which small amounts would not affect or would pass through, all the ulcerative processes, neuralgias, epilepsies and general nervous derangements possible for clots or congestions to produce would be just as readily produced by mercury.

Jewelry worn next the person, during hydrargic treatment, becomes coated with mercury which has passed through the skin. The skin of a mercurialized person will show numberless globules of the metal with the aid of an ordinary magnifying glass. Warm climates and hot water baths assist the elimination of mercury and morbid material from the system.

Dr. Fessenden N. Otis, in the *Boston Medical and Surgical Journal*, February, 1880, demonstrates that syphilis causes obstruction of lymphatic vessels, by deposits of arrested normal material, and cites Bäumler, Wagner and Rindfleisch as virtually supporting this view. This seems to explain how a deobstruent mercurial acts in syphilis. The globules opposing stasis of any kind would prevent these accumulations, but where the deposits were passing beyond the influence of deobstruent remedies, as in secondary, a longer course of treatment would be requisite.

The lymph channels and liver seem to have selected the smaller globules, while the blood vessels and kidneys contained the larger sizes in every instance in my observations. Whether globules had been subdivided into these parts or not, I cannot say.

While the skin affords exit for the metal when taken internally, it certainly admits also of its absorption into the body by vaporization or inunctions. Doubtless much of the ointment and vapor used is not absorbed at all, but the fact that any is, shows that even after elimination some of the mercury may undergo re-absorption if suffered to remain on the cuticle. It is necessary to supplement other efforts at excretion of mercury with frequent hot water baths.

In the course of a day after taking a mercurial, much of the globular multitude may pass and repass a given point many hundred times, some that has passed out passing back again until, finally, all is excreted or carried into bony or other tissues remote from active circulatory influences.

In a gram (15 grs.) of pilulæ hydragyri there is one-third of a gram (5 grs.) of pure mercury, which would cubically measure one-fortieth of a cubic centimeter. Taking .01 millimeter (Kölliker) as the average diameter of the capillaries, and remembering that when the metal is pharmaceutically mixed with confection of roses and liquorice root, it is visually "extinguished" but is microscopically existent as mercury globules, at capillary sizes .025 c. c. ($\frac{1}{3}$ gr.) of mercury would be divided into twenty-five million globules, which would be enough to engage the attention of the gastric tubules pretty generally, particularly as alternate ingress and egress may be given by single glands or groups of glands, vermic-

ular motions passing the globules onward through the canal to the absorbents.

Where hydragyria had been induced, let us assume that in three months mercurializing, at the rate of a gram (15 grs.) per day (which in quicksilver works can be considered a very moderate figure), and allowing one-half of this to have been excreted, there would remain forty-five grams (1½ oz.) of mercury lurking in the blood-vessels, bones, viscera, muscles, etc., capable of division into thirty-three hundred and seventy-five million particles, while he would have been subjected to the inhalation and absorption of twice this number altogether. Distributing these about the body by probabilities, we could have, say, three hundred million concerned in producing ptyalism through the parotid, submaxillary and sublingual glands and branches of the internal maxillary artery, with a portion (say a million) bearing directly upon the cerebro-spinal centers through the carotid and basilar arteries. The condensation of any thousand of these globules in certain areas would be more than sufficient to produce deleterious nervous effects from paresis to paralysis.

Naunyn, p. 618, says that living flowers serve as the most delicate reagents for detecting such dangerous impurities in the atmosphere; they die very quickly in an atmosphere containing mercury. A gold leaf becomes quickly covered in such an atmosphere, and a stick of wood, painted with flowers of sulphur, becomes brown on the surface, owing to formation of sulphide of mercury." It is not possible for a plant to live with its cellular spaces, through which pass nutrient fluids and gases, clogged up with multitudinous particles of metal, and this is the condition of the poisoned plant under microscopical examination. Parasites, with small tubular structures such as respiratory tracheæ are actually suffocated by these bullets lodging in those passages. "Ruminants are easily killed by mercury ointment; their lungs are congested and head drops to the ground." Taylor, p. 353. All quadrupeds whose heads are on the same level or most frequently below the level of the spinal column, would be most liable to have mercury accumulations in the vessels of the brain and cranium generally.

MERCUROUS OR BLACK OXIDE GROUP.

	Chemical Formulæ.	Combining Weights.			Doses decomposing into 2 parts of mercury, finely divided.
		Base.	Radical.	Total.	Parts.
1. Hg. oxidum nigrum.....	Hg_2O	400	16	416	2.08
2. Hg. chloridum mite	Hg Cl	200	35.5	235.5	2.35
3. Hg. iodidum viride.....	Hg I	200	127	327	3.27
4. Hg. bromidum....	Hg Br	200	80	280	2.80

Black oxide of mercury, at the head of this list, is the base of all mercurous compounds, and when decomposed they pass to the metallic state through reforming the black oxide, which is so unstable as to readily yield its oxygen to deoxidizing agents.

When these mercurous salts, in ordinary doses, encounter the pancreatic alkali, they are instantly converted into black oxide, which, in the intestinal glucose and heat is reduced to metallic globules varying little in sizes from those released by blue mass. For this reason the mercurous salts resemble the simple mercurials, within certain limits. When these salts are finally pulverized the globules formed in the system are much smaller, and hence more active. Small doses well triturated, taken at intervals, will produce better general effects because the metal then is more widely distributed through the body and in a finer divided state. Generally speaking, all these mercurous compounds act alike, and may be given in the same doses, the small differences being fully accounted for by the differences of atomic weight of their radicals. Thus the black oxide (p. 1257, U. S. Dispensatory) has been given in place of calomel in the same doses, and found to have identical effects. The green iodide contains $3\frac{1}{2}$ times as much iodine united to the same amount of mercury as there is chlorine in calomel, because chlorine weighs 35.5 and iodine 127.

Ten grains of calomel would yield $8\frac{1}{2}$ grains of mercury and $1\frac{1}{2}$ grains of chlorine, while the same amount of green iodide would afford only 6 grains of mercury and nearly 4 grains of io ine, which fact alone explains why the iodide may not be used

as freely as the chloride. The greatest danger attending the use of the green iodide is its instability and tendency to form the poisonous biniodide in liberating half its metal; thus 10 grains of green iodide can decompose into 3 grains of mercury and 7 grains of red iodide, which is anything but desirable. Practically, though, I think this liability is overestimated, and the chances are that the biniodide had been formed before ingestion wherever such accidents have occurred. In pill form the green iodide would in the pancreatic fluid act as calomel in forming black oxide, only equivalent weights would differ in the proportions of radical and base, as before mentioned. The bromide more closely resembles calomel in its effects, and the proportions are more nearly alike, the atomic weight of bromine being 80, while that of chlorine is 35.5; iodine being 127. Ten grains of bromide of mercury would break up into 7 grains of base and 3 of bromine. Calomel will always hold its position at the head of mercurous salts because it contains the largest percentage of base, and it is the *mercury* in these salts that constitutes the medicine and not the elements combined with it. Were it not for its instability the black oxide would be superior to calomel. Calomel is used in preparing pilulæ antimonii compositæ and pilulæ catharticæ compositæ. The lotio hydrargyri nigra is black oxide precipitated from calomel by lime water.

The Chicago Pharmacist and Chemist, November, 1879, quotes an article from *Pharm. Zeitg.*, Vol. XXIV, No. 68, which concludes as follows: "These experiments (of Verne, in *Reportoire de Pharmacie*, June, 1879), conclusively prove that no poisonous compounds are generated from calomel in combination with such bodies as salt, sugar, citric acid, etc.; and, whenever such mixtures have been followed by alarming symptoms, the calomel must have been an impure article. The proto-chloride of mercury is really a more stable compound than ordinarily considered, and it would appear that the bi-chloride is more easily converted into the proto combination than *vice versa*. In Wurtz' Dictionnaire de Chimie, we find the following statement: "Bi-chloride of mercury is easily reduced to the mono-chloride or even to the metallic state by many agents. Light will precipitate calomel from an aqueous solution," and further we read: "Many

organic substances will reduce bi-chloride of mercury to calomel or even to quicksilver, especially under the influence of light." In the face of these facts it can hardly be logically maintained, that calomel shows a tendency to assume a higher state of oxidation. It also appears absurd to prohibit the consumption of acidulous food while administering calomel, the more so when we consider the presence of free hydro-chloric acid in the stomach, and remember that the latter re-acts with calomel only at a boiling temperature."

MERCURIC OR YELLOW OXIDE GROUP.

	Chemical Formulæ.	Molecular Weights.			Doses decomposing into 2 parts of mercury, extremely divided.
		Base.	Radical.	Total.	Parts.
1. Hg. oxidum flavum.....	Hg O	200	16	216	2.16
2. Hg. chloridum corrosivum.	Hg Cl_2	200	71	271	2.71
3. Hg. iodidum rubrum.....	Hg I_2	200	254	454	4.54
4. Hg. cyanidum.....	Hg Cy	200	52	252	2.54
5. Hg. bibromidum.....	Hg Br_2	200	160	360	3.60

All the salts in this group are based upon, and decompose into, the yellow oxide heading the list. Alkalies precipitate from their solutions a very dense amorphous yellow oxide powder, which, when properly separated, breaks up into extremely minute globules in light, heat or deoxidizing agents, as sugar, etc. These globules are, as a rule, incomparably smaller and more numerous than those obtained from the mercurous compounds. As near as could be estimated micrometrically, they number one hundred million to six hundred million globules to the grain, inversely according to the concentration of the solution. A dose of one-tenth of a grain of the bichloride of mercury will contain, when precipitated by intestinal fluids, ten to sixty million of globules. It is in the power of any one to verify this rather startling assertion. By spreading the solution over a square decimeter of surface, and precipitating with caustic potash solution, this area will reveal, under the microscope, if care has been used in distributing the fluid equally, a yellow amorphous powder. A solution

of glucose, allowed to remain on the slide at the temperature of the body, or exposed to sunlight, will cause these oxide particles to break into black points, which, under high powers, become apparent as mercury globules in the numbers mentioned. The black powder, precipitated by stannous chloride from a soluble salt of mercury, will also be found to be very much more finely divided mercury than is afforded by reduced mercurous salts. If these particles are allowed to come in contact with each other, larger globules form. Blue mass yields many of these particles quite as minute but in minimum quantity. The mercuric salts form the maximum number of the minute particles, with a few large-sized globules accidentally formed. The red iodide has the disproportionate comparative quantity of radical and base as existed in the green iodide, and for the same reason. In these salts the radical is double the weight of corresponding mercurous salts. One quarter of a grain of the bichloride will nearly equal half a grain of red iodide when the same amount of mercury is desired (the exact figures are in the table, .271 Hg Cl_2=.454 Hg I_2). This proportion is exactly what is obtained, weight for weight, in giving bichloride of mercury in potassium iodide solution. One tenth of a grain of the bichloride will contain $\frac{74}{1000}$ grain of mercury and $\frac{26}{1000}$ grain of chlorine. The same weight of biniodide of mercury contains $\frac{44}{1000}$ grain of mercury and $\frac{66}{1000}$ grain of iodine, the bichloride having .3 more mercury and .3 less radical by weight than the red iodide. There is much less difference between the cyanide and bibromide, and corrosive sublimate, in this respect, the weights being respectively 52, 60 and 71. Tabulating all the mercuric compounds, the proportions of base and radical in one-tenth grain doses stands thus:

	Base.	Radical.	Mercury combined with.
Yellow Oxide,	.0926	.0074	Oxygen.
Corrosive Sublimate,	.0738	.0262	Chlorine.
Red Iodide,	.0440	.0560	Iodine.
Cyanide,	.0794	.0206	Cyanogen.
Bibromide,	.0555	.0445	Bromine.

Although the cyanide under less weight contains the same mercury weight as corrosive sublimate the latter will continue in favor because it is the better, safer and more eligible preparation.

The cyanide, by liberating its sedative radical in the stomach, prevents the epigastric pains accompanying disintegration of the bichloride. It matters nothing whether the cyanide is converted into bichloride in the stomach by the hydrochloric acid there, or whether it passes the pylorus as cyanide, both drugs precipitate the identical yellow oxide in the pancreatic fluid and all the mercuric salts undergo the same process of reduction to metal. All the mercuric salts named are soluble; the red iodide in potassium iodide solution, the bibromide in ether, the others in water. They are given in the same doses and in the pancreatic alkali release yellow oxide of mercury which undergoes further reduction to minute mercury globules in the intestines, blood and liver. Their physiological effects and poisonous properties are alike, they are based upon the same oxide and are reduced by similar means to the same condition. They contain exactly double the number of radical atoms as the calomel or black oxide mercurous group.

The yellow oxide ointment and lotion are of course prepared from this mercuric oxide. Ammoniated mercury is essentially the bichloride rendered insoluble by ammonia but retaining otherwise all the properties of the bichloride; there is an ointment made from this preparation, but this drug could be easily spared from the pharmacopœia. An ointment is made with the biniodide. Donovan's solution, the liquor arsenici et hydrargyri iodidi, is what its name indicates. This comprises all the mercuric compounds used in medicine.

SULPHUR AND NITROGEN COMPOUNDS.

1 Hg. Sulphuretum Rubrum,	Hg S,	Cinnabar.
2 Hg. Sulphas,	Hg SO_4,	Sulphate.
3 Hg. Sulphas Flava,	Hg O + Hg SO_4,	Turpeth mineral.
4 Hg. Nitras,	Hg 2 NO_3,	Nitrate.
5 Hg. Oxidum Rubrum		Red Oxide.

The first is insoluble and inert, when pure, and hence unfit for internal administration. When used by fumigation it liberates sulphurous acid and vapor of mercury. The second is officinal for the preparation of calomel and corrosive sublimate and is not used in medicine. The third has the poisonous properties

of the mercuric yellow oxide and like other sulphates, is an emetic. It contains both the yellow oxide and sulphate.

The fourth is used to prepare the liquor and unguentum hydrargyri nitratis, the escharotic and stimulant properties of which pertain to the nitric acid with which the mercury is combined.

The fifth is the base of a stimulant ointment, and has always been considered an allotropic form of the yellow oxide, but as far as my unfinished investigations extend I have been led to believe it to be a nitrate. The British Pharmacopœia names it nitrico-oxidum and the United States Dispensatory acknowledges that complete purification from the nitric acid with which it is made cannot be accomplished without endangering the compound. In every instance where the yellow oxide is formed, nitrogen, in a form capable of combination, has been excluded. In every process for obtaining the red crystals nitrogen has been carefully included. When the red oxide is thoroughly separated from the nitric acid used in the pharmaceutical preparation it becomes yellow oxide. The differences between the two forms may be presented thus:

YELLOW OXIDE.	RED OXIDE.
Prepared by precipitating mercuric solutions with K H O. Forms yellow amorphous powder. When prepared in any way nitrogen capable of combining is excluded.	Prepared by heating nitrate of mercury till red fumes cease. Forms red crystals. When otherwise prepared, as in air, forms with difficulty, owing to nitrogen not readily combining, but nitrogen never excluded.
Has been proven to be an oxide.	Has not been proven to be an oxide nor found apart from nitrogen, and responds to tests for subnitrate.
Mercury forms only two oxides, the black and yellow.	Mercury forms more nitrates than any other metal, and unknown nitrates exist.
Combines readily.	Combines with difficulty.
Forms mercuric oxalate; with cold solution oxalic acid.	Does not form oxalate.
Readily forms oxychloride with $Hg\ Cl_2$. solution.	This change very slow with this form.
Boiled with potassic dichromate yields basic mercuric chromate. $Hg\ Cr.\ O_4$, 2 Hg O.	Similarly treated forms basic salt with larger proportion of base $Hg.\ Cr.\ O_4$, 3 Hg. O. (Millon.)
Does not blacken on heating.	Blackens on heating (assuming the color of mercurous oxide).

Nitrogen in some form is required to convert it into red oxide.	Neutralizing its acid solutions precipitates the yellow oxide, thus abstracting nitrogen.
Physiological action milder and not escharotic.	Physiological action harsher, irritating and escharotic.

I have not been able, as yet, to fully demonstrate that the red oxide is a nitrate, but as the evidence thus far is against its being a pure oxide, and in favor of its being a nitrate, it is placed provisionally in the last list as anomalous. I hope soon to succeed in obtaining a satisfactory conclusion one way or the other. Allotropy is a miserable mystery that needs more thorough investigation than has been given it.

TOXICOLOGY OF MERCURY.

In examining tissues to discover whether poisonous doses of mercury had or had not been introduced into the body during life, no one can conscientiously assert, from any chemical testing, the form in which mercury has been taken by the person whose body is being examined, unless most extraordinary doses have been used. We have many excellent tests for mercury, such as the electrolytic and formation of soluble salts by reagents which destroy the tissues; but the physiological conditions of the primæ viæ will always afford the most reliable evidence. The ether test of Orfila is, perhaps, one of the best methods of determination, but often this, as Mailhe claims, may be interfered with by the presence of certain chlorides. He says the mercuric oxide interferes with the test. This, I believe, is not because mercuric oxide exists in the fluid tested, but because the alkaline condition which has previously formed the mercuric oxide, also prevents the ether from holding the salt in solution. The true difficulty lies in our ignorance of the forms in which it is possible for mercury to exist in the body, and of the capabilities of ante or post-mortem compounds to create a different form of the drug than the one taken. So long as we do not know precisely what forms mercuric salts may assume in the fluids of the body before or after death, we will have no right to assert, upon chemical grounds alone, the form in which mercury has been taken. I think we have reasons for believing that all of the therapeutical doses of mercury, and even small poisonous doses, are completely

reduced to the metallic state by the animal fluids. Taylor on Poisons, Wormley on the Micro-Chemistry of Poisons, and Naunyn in Ziemssen's Cyclopædia mention the petechial spots and injected appearances of the intestines after corrosive sublimate poisoning, but do not say whether the "deep yellow tint and beautiful arborescent red material in the inner coat of the mucous membranes" is blood, bile, or the red and yellow oxides of mercury. The probability of its having been an oxide increases in considering the case mentioned by Wormley, p. 326, where the stomach "contained a small quantity of bright yellow fluid, having the consistency of thin gruel, and its curvatures presented patches of dotted injection of a bright crimson tint, and the mucous membrane was a little softened in the neighborhood of the most vivid red patches." The small intestines were thus injected while the large intestine was healthy. It is well known that corrosive sublimate is precipitated by organic substances fibrin, casein and mucous membrane. Taylor, p. 303, notes that after a case of red precipitate poisoning, that substance was found imbedded in the mucous membrane of the stomach and intestines. The symptoms of poisoning by the red oxide are very much like those of corrosive sublimate. In the last case that Taylor mentions, the red precipitate would naturally be sought for in the tissues, but in the other cases presenting similar appearances, it did not occur to them to test for the yellow or red oxide. In the stomach and intestines of a hen, which I poisoned with four grains of corrosive sublimate in two per cent. solution, I found the yellow oxide of mercury and blood vessels of the submucous tissue injected with bright red blood. The liver, under microscopic examination, showed plainly multitudes of characteristic mercuric globules of the metal, but from an ethereal solution of part of the liver substance I obtained, by precipitation, evidence that an extraordinary dose, such as I gave, can so saturate the animal fluids as to prevent further reduction. I applied two drops of the same solution of corrosive sublimate to the foot of a frog, and found a slight shrinkage of the web only to be apparent. By pouring a strong alkali on this foot, and washing it off with a stream of cold water, some of the lymphatic lacunæ appeared injected with a yellow substance. The other foot,

which had been carefully kept out of the way of the operation, I then examined with the microscope, and found threads and patches of silvery white substance in incident rays in the course of the lymphatics. This appearance did not exist previously. The poison seemed to have overwhelmed the circulation of the foot and leg upon which it was placed and to have been conveyed unreduced into the general system. In six hours the poisoned leg was greatly inflamed, and in twenty hours the frog died. The poison must have reached the intestines, judging from their inflamed condition, and a very superficial examination of the liver enabled me to count 700 minute globules of what I felt justified in believing was mercury. "Frerichs on the Liver" records that its author has found gall stones containing mercury globules, which would, in connection with other evidences, indicate that hepatic products were opposed to allowing the presence of an unreduced form of the mercury salts. The kidneys, after large toxic doses are found engorged and the urine suppressed. I found that fresh urine instantly precipitates white crystals and yellow powder, and in looking up references, found the following:

"Mercuric chloride forms with a solution of urea a white precipitate 2 C O H_4 N_2 3 Hg O, which turns yellow in boiling water. On adding Hg O to a warm solution of urea the compound C O H_4 N_2, Hg O appears to be produced." (Watt's Chemistry, Vol. V, p. 953.) "Urea does not precipitate any metallic oxide from its acid solution, but when added together with an alkali, a compound of the metallic oxide with urea is often precipitated. (Prout comp. Werther, also Liebig, p. 374, quoted by Gmelin, Vol. XII., p. 375.) "Mercuric nitrate and urea precipitates C_2 H_4 N_2 O_2, 4 Hg O, N O_5 as white insoluble powder. (Gmelin Vol. VII., p. 374.)

"Urea with protochloride of Hg. cannot be obtained in its crystalline form from the aqueous solution, but separates in that form from a solution of the two substances in boiling absolute alcohol." (Ibid.) "Mercuric nitrate added to solution of urea with potash gives a white precipitate C O H_4 N_2, 2 Hg O. (Watts, Vol. V. p. 953.)

"Liebig says when mercuric nitrate is added to solution of

urea a white insoluble precipitate falls with composition 2 C O $(N H_2)_2 + 3 Hg O + Hg (N O_3)_2$." (Roscoe and Schorelemmer, Vol. 1.)

This is enough to convince us that a soluble form of mercury cannot exist in urine as normally constituted with an abundance of urea, and that whether glucose is or is not present it can exert but minor influence in reducing the mercuric salts. As the microscopic appearances presented by repeated experiments, showed two compounds, instead of one, in the mercuric precipitate of urine, one of which seemed to be identical with the amorphous yellow oxide, the passages given above would be insufficient were it not for Watts (Vol. V., p. 954), who after detailing Liebig's formulæ for precipitates given by $Hg Cl_2$ and mercuric nitrate with urea, each ending with two to four atoms of Hg O, says the composition of these compounds is not yet definitely fixed. "It is not known indeed whether they contain mercuric oxide and nitrate of urea, or urea combined with mercuric nitrate and mercuric oxide."

This with the microscopic appearances, until the contrary is proven, will justify belief in the separate existence of the yellow oxide and a carbamidic product precipitated from soluble salts of mercury in urine. The filtrate throwing down no precipitate with caustic potash and the great quantity of the original precipitate from a drop of the mercuric solution shows that all the mercuric salt is decomposed.

An excessive dose reaching the kidneys unreduced would encounter urea enough to decompose more of the poison, the precipitate would thus occlude the uriniferous tubules and account for the congestion. In some cases noted by toxicologists, mercuric chloride must have reached the bladder for that viscus has been found, after poisoning, shrunken and disintegrated. The destructibility of this form of mercury does not depend alone upon its solubility, but chiefly upon the fact that its solutions decompose and liberate its caustic chlorine and countless, minute, but nevertheless heavy, particles among tissues it may rend apart, and vital avenues it may close.

ARTICLE II.

BLOOD-LETTING IN THE TREATMENT OF PNEUMONIA. By T. F. WORRELL, M.D., of Bloomington, Ills.

The following paper on blood-letting was read by Dr. Worrell before the McLean County Medical Society:

Gentlemen of the McLean County Medical Society:

You asked me at your last meeting to submit to you at this time the views I entertain with regard to the agency of venesection in the control of pneumonia.

The first remark I have to make is that when I said I could demonstrate the potency of blood-letting to arrest that disease, I had reference only to the acute form of it, uncomplicated by any condition contraindicating antiphlogistics, only the sthenic variety, if we may so designate it.

I do not propose to introduce any authors for the purpose of showing that pneumonia is properly treated by bleeding, for this would not be germane to the inquiry. The specific subject assigned me requires me to show that the disease under consideration is treated *rationally*, when it is treated antiphlogistically, especially when it is treated by *venesection*.

I shall not enter upon the discussion of the question, "Are Congestion and Inflammation Different Entities?" but shall assume that the first stage of inflammation is congestion, which signifies an undue accumulation of blood in a part, that interferes with the onward movement of the sanguineous fluid. This stage of inflammation, which Andral calls hyperæmia, is marked by (of course I am considering active congestion) such inordinate activity of the part—of the lung in pneumonia—and by such exalted temperature as to induce not only functional disturbance, but also, if not arrested, serious deposits, especially of serous and plastic matter. In *all* cases of acute pneumonia, active congestion is a necessary antecedent of that morbid condition which gives rise to the effusions which render this disease one of so grave character. Without these deposits, pneumonia would be

regarded as one of the mildest forms of disease. On account of the liability to their occurrence, it is classed among the gravest diseases in the great catalogue of human maladies. This is explicable upon the ground that during the period of simple engorgement, or congestion, the capillaries are easily emptied; and, getting rid of their redundant contents, readily assume their normal caliber, and so all the morbid and often fatal consequences which result from *established* inflammation are easily averted.

Having shown what I suppose none of you will deny, that pneumonia in its forming stage is attended by an increased amount of blood in the part which involves all the tissues that compose the pulmonary parenchyma, *i. e.*, the air cells, the minute tubes, the intervening cellular tissue, and the vascular ramifications, I will state, as the next condition, that the fibrin of the blood is in great excess, and that this excess of fibrin is accompanied by a corresponding excess of albumen or coagulable lymph; that these two substances unite to form that yellowish substance which we call the buffy coat, and that this composite substance indicates not only the intensity of the pulmonary lesion, but also the extent of it as well.

This buffy coat is not confined to those who are suffering from inflammation; it also abounds with those who are plethoric and with pregnant women; all from the same source, a predominance of fibrin in the blood. Andral says that "in nearly all cases of acute inflammation there is an excess of fibrin, and the lymph globules of the blood." That, from three parts in a thousand, which is the normal proportion it often rises to six and even ten parts in pneumonia and rheumatism. This great pathologist further says that the appearance of the buffy coat in pneumonia is dependent on this excess of fibrin, and that it materially affects both the duration and products of the local disease. [In this place allow me to digress so far as to say that there is no authority for the presence of this buffy coat (the evidence of such inflammation) in those diseases that are infections.]

Another position I assume is that in the incipiency of this disease there is always a *focus* from which the irritation radiates, that is that it is at first *local* and afterwards spreads out into a larger field, limited often by the confines of the organ which it

assails. This original point of irritation serves to invite the blood to it and its neighborhood, which has the effect not only to intensify the fire already started but to extend its glow to the adjacent parts and thus, very soon, there is fuel enough for a general conflagration. The old aphorism, "Ubi irritatio ibi affluxus humorum," is as true to-day as it was when it was first uttered, the woeful defection from its indication of treatment to the contrary notwithstanding.

We now come to inquire what is the most urgent indication in the *treatment* of pneumonia, and *how* may that indication be most surely and promptly fulfilled?

I answer that the paramount indication is to relieve as quickly as possible the engorged vessels, and thus prevent the occurrence of those effusions which always render the disease a grave one.

As I would not throw combustibles into a fire, if I wished to extinguish it, so I would arrest that tendency to a rush of the fuel which fans and re-supplies the flames of inflammation towards the point at which it started, and thus expect to smother it before its flames have consumed the citadel of life. The blood, and that charged with an inordinate amount of the elements which promote inflammation, should not be permitted to circulate so rapidly and in such augmented quantity in the parts diseased. And this brings me to answer the second part of the query already propounded, viz., How may this indication be fulfilled? I answer that the most prompt, the most rational and the most certain way in which to accomplish it, is by reducing the inflammable material as fast as possible. The abstraction of blood directly from the general current is the only rational mode of arresting the flame already spreading, thus withdrawing those elements upon whose free supply pneumonia must depend—if I may so speak—for its progress towards that stage of it in which the deprivation of blood could be of no service, but which tend to curtail those resources upon which the patient might be compelled to rely, while he was waiting for those changes to take place, now rendered unavoidable by the establishment of that condition of the breathing organ which venesection could not possibly rectify.

I need not remind you, gentlemen, that all authors from the dawn of medicine down to a recent period, have advocated deple-

tion by the lancet as the most prompt and reliable expedient for arresting pneumonia in its acute stage.

They have all insisted that this is demanded not for its direct effect arresting inflammation, but also for lessening the labor of the lungs and thus giving rest for the suffering organ, as far as it is possible to do that. They argue that as all the blood in the body must pass through the lungs, after reaching the heart, before it can be again distributed, and, as in pneumonia, a large portion of the lungs is incapable of performing its functions perfectly, an increased burden falls upon the healthy portion, and thus not only is the same part unduly loaded with blood, but the movements of respiration are necessarily accelerated. Against this old theory of pneumonia, as to its pathology and treatment, is arrayed the new doctrine that it is an infectious disease, that the local symptoms are but expressions of this infection which has tainted the whole body, and that, therefore, the patient should be sustained "ab initio" by such regimen and medicines as tend to overpower the infection and fortify the system against its ravages.

I believe that no standard work of American authorship has espoused this new theory; but it is adopted by some German and English pathologists. Before summing up what I have to say in the argument for venesection, I will briefly consider some objections to this modern idea.

And first, it places pneumonia in that class of diseases which are self-limited. There are but two distinct classes of infectious diseases, viz: those which are self-limited, and those which do not terminate spontaneously. To the first class, the disease under consideration must belong, if to either. Now, the general conviction is, that infectious diseases of this class are terminated by elimination of materies morbi which produces them, or its destruction by catalysis. Of this class typhoid fever may be regarded as the type. I think I may safely assume that there is no physician who comprehends the pathology of typhoid fever, who will say that it may be aborted or arrested in a time too short for elimination of the infectious matter. This is just as true of all other diseases of this character. They all have a definite course, and the limit of their duration depends upon the time required for their development, and for the destruction or elimination of that toxemic agent which induces them.

Now the proof that pneumonia does not belong to this infectious class of diseases, is to be found in the fact, first that there is no fixed period for its continuance, its duration being dependent not upon the occupation of the blood by a poison which it requires a certain number of days to remove, but that it may be easily arrested in its first stages, the inflammation terminating in complete resolution, and all in a few days; and, secondly, that the products of the morbid condition of the lung, which we call pneumonia, are like those which result from inflammation existing in any part of the body, without any reference to the cause of that inflammation. Much more might be written on this subject, but I have already written enough. I will conclude this paper by reference to some reflections on the subject of it by Dr. Henry Hartshorne, of the University of Pennsylvania. He says that venesection is one of the oldest, and has been one of the most universal remedies for inflammation. Although blood-fearers have appeared now and then in all ages and nations, yet the aggregate testimony of the profession from Hypocrates down to the present time, has been in favor of blood-letting in the treatment of inflammations and congestions. In these later years it is true that bleeding has more opponents and fewer advocates than at any previous period in medical history. Why is this true?

First. Because of reaction from the great abuse of the lancet.

Second. A radical change in the type of almost all diseases, by which they have become asthenic.

Third. False construction of recent science, which according to Virchow and others, makes no difference between morbid lesions whatever may be their cause; and that stimulation, irritation, and inflammation are essentially and practically, as well as *causatively*, different degrees of the same vital impression.

Fourth. Leadership and fashion.

By the abstraction of blood in pneumonia we lessen—

1. The plethora of the vessels.
2. The number of red corpuscles.
3. The force of the heart's impulse.
4. The excitement of nervous system.

By all these influences venesection has the effect to diminish

the vascular excitement which belongs to inflammation and thus diminish the liability to destructive disintegration. If this is true then the assumption of Prof. Bennet and others of his class, that inflammation is a self-limited process, which cannot be cut short, is certainly erroneous. What, in the last place, is the modus operandi of blood letting? I answer, it restores the equilibrium of the circulation; it reduces disproportionate vascular congestion; it restores the *balance* of the circulation. It absolutely relieves the organ inflamed of *that* which is an essential factor in inflammation, a sine qua non to its existence, *i. e.* an inordinate amount of blood, charged with an excess of those very elements which are so greatly concerned in the production of those consequences which alone make pneumonia a perilous disease.

ARTICLE III.

ALCOHOLISM AS A DISEASE. By S. F. BENNETT, M.D.

Dr. C. W. Earle's article on "The Cinchona Cure for Intemperance," published in the February number of THE JOURNAL AND EXAMINER, excites my surprise in this—that any one having experience in the use of the drug cinchona rubra, should pronounce its effects nil in the treatment of alcoholism. Of the "cinchona cure" dispensed by the specialist Dr. Earle mentions, I have nothing to say, but I am impressed with the belief that the analogies between that class of diseases in which cinchona is so near a specific, and alcoholism are so remarkable as to make it probable that the same remedy should prove efficacious in both.

For a long time my attention has been called to the curious, and sometimes startling, analogies in the phenomena of alcoholism and so-called "malarial affections." Both have a special causation, the first alcohol, the second a morbific agent commonly known as malaria. The causative relation of alcohol to drunkenness, none will dispute, and it is not germane to discuss here the arguments in favor of the existence of a special morbific agent as the cause of intermittent, remittent and pernicious fevers since it is with the phenomena only of these diseases, and alcoholism, that I propose to deal.

The most singular characteristic of the simplest form of malarial disease, intermittent fever, is periodicity. We have a cold stage, a stage of pyrexia and a sweating stage with intermissions of remarkably equal length, during which the system returns to an apparently, almost, normal condition. Each variety of the type observes its own law of periodicity, be it quotidian, tertian or quartan—a pathological mystery yet unsolved. Exposure to the morbific influence for a certain time, varying with different subjects, is necessary to the development of the disease. The period of incubation may be a few days only, or a few weeks, or it may be many months. Analogously, we find that a large proportion of drinkers are *periodical* drunkards. The intermission between paroxysms of debauch may not be as uniform in a given case as in those of intermittent fever, but they are uniform enough to plainly stamp them as "periodic." The more common drunkard is not he who drinks every day, but he who has a "spree" once in just about so long. And as a variable time, in different subjects, is required for the specific materies morbi to produce intermittent fever, so indulgence in drink varies in the time necessary to establish the alcoholic habit. In both classes of patients we find an approach in the system to a normal standard, but in both the disease is only temporarily quiescent. In intermittent fever auxiliary causes, as exposure to cold, over-exertion or excesses in eating or drinking are sometimes necessary to give efficiency to the special cause of disease, and in alcoholism the same causes may bring on the slumbering desire for drink. How often is a "bad cold," "a headache" or "fatigue" pleaded as the incentive to a debauch.

There is a second class of drinkers in whom the disease has assumed a more continued type, with remissions instead of intermissions; that is, the patient is impelled to drink more or less every day, with occasional periods of excessive debauch. We have in remittent fever the analogue of this type of alcoholism. Intermittent and remittent fevers are mutually convertible into each other, both are due to the same specific cause, and both succumb to the same specific remedies. In remittent, on the advent of the febrile stage, the movement continues for a variable length of time, from six to forty-eight hours, and then notably subsides;

the skin becomes moist, the frequency of the pulse is reduced, but the fever does not entirely disappear; there is not complete apyrexia; there is a remission, but not an intermission. Sometimes the remission is marked, sometimes it is slight. After a time the febrile movement is renewed with as much or more intensity as at first. Nausea and vomiting are prominent symptoms. The matters vomited are yellowish or greenish in color, there is distress of the stomach and epigastric tenderness. The functions of the mind are often notably disturbed. Jaundice occurs in a certain proportion of cases. What a remarkable resemblance do we here find to that type of alcoholism seen in the steady drinker! As with the victim of remittent, no intermission occurs in which the physical system is free from the power of the disease, so with the steady drinker, no intermission gives relief to the disease-permeated body or beclouded intellect. To-day his perverted appetite calls for somewhat less of the customary poison, but to-morrow it demands more to make up the temporary loss. To make the analogy more complete and more surprising, distress of the stomach and epigastric tenderness are present, nausea and vomiting common, and jaundice not infrequent.

A graver type of malarial affections is pernicious fever, due to the same specific agent, but characterized by phenomena more remarkable and much more apt to end in death, than those of the milder types. It is, indeed, one of the most formidable affections with which the physician is called to deal. In some cases profound coma may be present; in others active delirium of a violent and dangerous character. The essential morbid conditions are the same as in the milder types but intensified and exaggerated. The materies morbi of the disease makes a most profound and alarming impression upon the powers of life. It is the last and most virulent exhibition of the malarial poison. Its onset may be similar to that of chills and fever, or remittent; in two or three days the skin becomes livid, shrunken and sometimes clammy, countenance anxious, thirst intense, stomach excessively irritable, mucous vomitings, pulse small, weak and rapid, restlessness marked, or in some cases, drowsiness and hesitation of speech; and coma or tetanic spasms may supervene.

If death do not take place in the collapse, partial or complete reaction follows in a few hours, but the next day at about the same hour another paroxysm occurs, more dangerous than the first, and if a third be allowed, it is generally fatal. In that condition known as delirium tremens we have the analogue of pernicious fever. The two conditions have many symptoms in common. The access of delirium tremens is marked by insomnia, anorexia, depression of spirits, and muscular tremor, notably of the tongue. In two or three days mental aberration of a peculiar character supervenes and remarkable restlessness. Illusions crowd the distempered brain. If a favorable termination happen, sleep at length ensues, out of which the patient awakens free from delirium. If the affection pursue an unfavorable course, the insomnia persists with great prostration, delirium continues, the body is bathed in perspiration, the pulse becomes more weak and frequent, and coma generally ends the scene.

Now, aside from those theoretical reasons for confidence in cinchona for the cure of alcoholism educed from the above analogies, I have undeniable and positive proofs of the cure of drunkenness by this agent. I have as much confidence in it as I have in the sulphate of quinia in intermittents. I do not judge by hearsay, but by actual experiment and observation. I know of radical, and, so far, lasting cures of confirmed drunkards. The effect of the medicine is not to create a disgust for alcohol, but a total indifference. If a patient will voluntarily recommence the use of alcoholics, his disease returns, just as the patient cured of intermittent will again contract that disease if again exposed to malarial poison. There are plenty of inebriates of naturally low and brutal instincts who will drink for the effects of it, whether they have a drunkard's craving for it or not. Is it not of this class that the "relapses" are made up? Have not the failures been due to inefficient administration of the medicine? My experience with the "cure" has been so entirely different from that of Dr. Earle that I would like to have physicians generally test the matter and report through the JOURNAL AND EXAMINER.

RICHMOND, ILL., February 25, 1880.

ARTICLE IV.

THE AUDIPHONE AND KINDRED INSTRUMENTS.

By E. L. HOLMES, M.D., of Chicago. (Read before the Medical Society of West Chicago.)

Any improvement in the application of a well-known principle, which tends to mitigate human suffering or ameliorate any infirmity must be a subject of interest to every physician. Such improvement if it be of advantage to but a small proportion of cases for which it seems theoretically applicable, claims careful consideration.

There have recently appeared in the daily journals of the East and the West so many notices of public demonstrations, in which it is said the deaf are made to hear by means of the audiphone, that I have thought it might be of interest to members of this society to know definitely on what basis these reports rest.

It is generally known that some patients can hear a watch, held between the teeth or in contact with some portions of the head, better than when it is placed quite near the ear.

It is not so well known that a few patients, who cannot hear loud conversation, can converse readily through the medium of a small piece of wood, twenty inches, more or less, in length, one end being held between the teeth of the patient, the other end between those of the person conversing with him. The vibrations of sound are conducted through the tissues of the head to the auditory nerve. The use of the audiphone is based on the principle involved in these experiments.

The instrument is a thin but quite large plate of black vulcanized rubber, to which is attached a handle. The whole may be said to resemble a square fan.

By means of cords and a clamp near the handle, the upper edge of the thin portion may be brought downward, causing the whole plate to curve. The fan in this form is usually placed with the concave portion turned toward the person using it, the upper edge being gently pressed against the upper (eye)teeth.

The vibrations of the fan produced by sound are conveyed through the teeth and bones to the ears.

According to my own observation and that of those upon whose testimony I can rely, the number of the deaf, who are thus practically benefited is exceedingly small. Occasionally a patient is aided in hearing to a remarkable degree.

Published statements regarding the extraordinary results in the use of the audiphone should be received with great reserve. Some of these statements are gross exaggerations. Poor patients, especially, should be cautioned not to waste their means in purchasing the instrument before they have tried it, for it will certainly, in a majority of cases, disappoint them.

I have heard of patients whose hearing was improved by the use of a sheet of bristol-board, a broad plate of wood or of a Japanese fan, bent to a proper curve (tension) and placed in contact with the teeth.

It is doubtful whether the most approved form and material for this instrument has yet been discovered.

Possibly a round fan with a delicate rim of steel, the whole so constructed as to resemble in form the natural membrana tympani (concave) might be more beneficial and graceful than that now in use.

Possibly also a piece of hard rubber or other substance attached to the disc (fan) as the malleus is attached to the membrana tympani, might be a better medium for conveying the vibrations to the teeth.

It may be that the efficacy of the audiphone (and dentaphone) may be increased in some cases by closure of the external meatus as in certain experiments with the tuning-fork.

Another instrument, the dentaphone, constructed on scientific principles, is composed of a vibrating disc enclosed in a case resembling the mouth-piece of an ordinary telephone. Attached to the center of this disc is one end of a cord; the other end of the cord is fastened to a small piece of wood. The vibration of the disc, communicated through the cord to the piece of wood held between the teeth, is conveyed to the auditory nerve.

It is stated on reliable medical authority that this contrivance compares most favorably with the audiphone.

It may not be out of place to make brief allusion to the means which have been devised to improve the sense of hearing.

These are chiefly the ordinary trumpet and the artificial membrana tympani.

The action of the trumpet is too well understood to require comment. I will only state that each patient must try for himself the various forms of the instrument and select the one with which he hears best.

The artificial membrane is usually a simple disc of rubber or fish scale, to the center of which is attached a delicate style of metal or rubber. In place of this little instrument a small pellet of cotton, properly adjusted in the external meatus is often employed. These are used not only to improve hearing but also to protect ulcerations from the air and assist in the curative process. It is remarkable to what extent these simple means will, in exceptional cases, improve hearing.

I may state that all forms of auricles, vibrators, and invisible tubes so often advertised in exaggerated terms as enabling the deaf to hear distinctly are almost absolutely valueless.

The audiphone is an invention of Mr. R. S. Rhodes, of Chicago. The dentaphone is manufactured in Cincinnati.*

THE PROGNOSIS OF CÆSAREAN OPERATIONS is the subject of an article by Dr. Lusk of New York in the January number of the *American Journal of Obstetrics*. In this paper Dr. Lusk, after recounting the results obtained by various well-known operators and analyzing the details given of the cases, arrives at the conclusion that the operation has been frequently performed in unhealthy maternity hospitals, and also frequently on patients that were beyond hope of recovery before the operation was commenced. He argues that it is unfair to blame the Cæsarean operation for fatal results when the conditions were so unfavorable that any operation would have gone wrong.

* While writing the above some weeks ago, I had read no article on the subject except the one by Dr. Turnbull, in the *Archives of Otology*. Subsequently I received a reprint of an article by Dr. C. H. Thomas, from the *Philadelpha Medical Times*.

Clinical Reports.

NOTES FROM HOSPITAL PRACTICE.

ARTICLE V.

MERCY HOSPITAL. IN THE SERVICE OF PROF. N. S. AND DR. F. H. DAVIS. (REPORTED BY E. C. HELM, M.D.)

Typhoid Fever.

Fully one-half of the cases of typhoid fever treated in Mercy Hospital during the past few years have had no diarrhœa, some being constipated during the entire course of the disease and others having one natural daily movement of the bowels.

Of the cases of diarrhœa, those in which there was copious hæmorrhage from the bowels during the second or third week were regarded as being in the greatest danger, particularly if the tongue became very dry and brown, with sordes on the teeth, low muttering delirium, subsultus tendinum, and sudamina on neck and chest.

The last mentioned symptoms being regarded as almost surely indicating speedy collapse.

The treatment has been: 1. Hygienic. 2. To prevent deterioration of the blood. 3. To restore the natural secretions. 4. To reduce the temperature. 5. To control the action of the bowels. 6. To maintain innervation. 7. To control the action of the heart.

The air is kept pure and wholesome, at as nearly as possible a uniform temperature of 65°—70° F.

The bedding and underclothing are kept clean—are aired and changed frequently.

All excretions are at once removed from the ward.

The patient is kept clean, cool, and as comfortable as possible, by frequent spongings with tepid water, to which is added salt, or preferably vinegar, thereby partially controling the temperature, favoring diaphoresis and greatly adding to the comfort of the patient.

They are fed with the blandest nourishment, such as milk, thin wheat or oat-meal porridge, beef tea, etc., but the main reliance is placed upon the milk, beaten up with the white of an egg and sugar. From (℥i–ij) four to eight grams of this are given four or five times a day during the first week, after which smaller quantities, from (℥ss–i) two to four grams, are given every hour, as starvation is believed to have a prominent place in the causes of death from typhoid fever.

When thirsty, the patients are given small pellets of ice to hold in the mouth; milk-whey, or better still, buttermilk, is often given, thus forming a cool, pleasant, yet diuretic drink.

For the first day or two potas. chlorate, (gr. iii) .250 gms. and acid hydrochloric, (grs. ij–iv) .130 to .250 gms. every three hours, alternating, if the bowels are constipated with minute doses of calomel and ipecac. If, on the contrary, the bowels are loose, pulv. dov. is used.

After the first thirty-six hours:

		Gms.
℞	Acid salicyl.....(℥ss)	15
	Sod. bicarb.....(℥ijss)	10
	Glycerinæ .....(℥x)	40
	Aquæ .....(℥iv)	120

A dessertspoonful of this is given every two to four hours, alternating with spongings.

This is continued until the temperature is reduced to 100° F. and then just enough of the salicylic acid is used to keep it there.

Should there be much diarrhœa, enough tr. opium is added to check it.

Tr. digitalis is usually added to the above formula to act as a diuretic, but more especially to keep the heart within bounds. Digitalis has been found especially beneficial when the heart was very weak and feeble. Should the tr. digitalis be not sufficiently diuretic, liquor ammon. acet. or spts. æth. nit. is added.

During the second week, if the bowels are very loose:

		Gms.
℞ Olei terebinth	(ʒiii)	15
Tr. opii	(ʒv)	20
Olei gaulth	(ʒss)	2
Pulv. acaciæ	(ʒi)	30
Sacch. alb	(ʒi)	30
Aquæ	(ʒiv)	120

Of this (ʒi) four grams is given every four hours. This has usually promptly controlled the bowels, but in a few cases the turpentine has disagreed with the stomach or caused symptoms of strangury. In these cases it was promptly discontinued and a pill consisting of

		Gms.
℞ Argent nit	(gr. $\frac{1}{3}$)	02
Ext. Hyoscyam		
Pulv. opii	(āā gr. j) āā	06

substituted.

The nitrate of silver is not continued long, as permanent discoloration of the skin is feared, but after three to six days is replaced by

		Gms.
℞ Acid sulph. arom., magnes. sulph		
Tr. opii	(ʒij) āā	8
Syr. simp		
Aquæ	(ʒi) āā	30

Of this a teaspoonful is given every three to four hours while the diarrhœa lasts.

Should low, muttering delirium, subsultus-tendinum, petechiæ, etc. ensue, indicating nerve failure, the patients are given

		Gms.
℞ Strychniæ sulph	(gr. $\frac{1}{32}$)	002
Acid nitric	(gtts. iij)	2

every two hours.

Brandy or any of the other so-called alcoholic stimulants are not given, as it is believed that they have a positively depressing effect, and in too many cases turn the scale of the patient's life toward a fatal end.

The diffusible stimulants, notably arom. spts. of ammon. or carbonate of ammon., are freely used and with decided benefit.

The results of the above treatment have been decidedly favorable, the death ratio being much below that given as the average, in hospitals where alcoholic remedies are freely used.

Large doses of quinine, or cold baths have been found to be efficient, yet dangerous, methods of reducing the temperature, the quinine often enfeebling innervation, while the shock and subsequent reaction following the use of cold baths, have more than counterbalanced its good effects.

During convalescence, if the patients are constipated, they are given

		Gms.
℞	Ext. Hyoscyam.....	
	Ext. Leptand.....	
	Ferri. sulph. ext.....(gr. i) āā	06
	Ext. nux vom.....(gr. ½)	02

S. One at night.

If the bowels are loose they are given

		Gms.	
℞	Strychniæ.....(gr. i)		06
	Acid nitrici .....(ʒ i)	4	
	Tr. opii .....(ʒss)	16	
	Aq. and syr. q. s. ad.....(ʒ iv)	120	

Mix. S. Teaspoonful three or four times a day.

Some of the bitter tonics, as tr. cinch. comp., are found of use. Special attention is paid to diet during convalescence, the food being plain, wholesome, nutritious, yet bland and unirritating. The patients are to avoid exposure to drafts of air, inclement weather or over exertion for several weeks.

ARTICLE VI.

Treatment of Indolent Buboes.

Every surgeon engaged in hospital practice has had his patience tried by the obstinacy of that class of buboes termed indolent or chronic. Such buboes will neither suppurate nor recede, in spite of treatment, and it is not unusual to see patients thus affected remain in hospital for six months and longer. Many surgeons, after exhausting all methods of treatment calculated either to

cause the suppuration of the gland or the absorption of the inflammatory products, such as the local application of iodine, nitrate of silver, blisters or continuous pressure by a bag of shot suspended from the ceiling, have recourse finally to the knife and extirpate the gland. This latter practice unquestionably removes the trouble, but I am led to believe from a somewhat extensive experience, is very apt to be followed by a severe grade of erysipelas. Even if the patient is fortunate enough to escape an attack of erysipelas, the wound left after the removal of the gland granulates very slowly, and generally eight weeks elapse before cicatrization is completed.

While stationed in San Francisco, I treated a number of indolent buboes by introducing needles attached to a galvanic battery, as recommended by Beard and Rockwell, but with very limited success. The pain accompanying this procedure is intense, even more so than that caused by destroying the bubo with chloride of zinc pastes or other powerful caustics. During the past year I have treated all such buboes occurring in my wards at Philadelphia and my present station, Portland, Maine, by a simple method, which has afforded better results than any other treatment mentioned. Through the indurated gland I introduce from three to four setons, the materials being either a stout piece of tape or ilver wire, tied in a short loop, drawn backward and forward hrough the gland twice daily and covered with a flax-seed poulice. The setons are allowed to remain from seven to ten days, or longer, suppuration occurring generally the third day, with a rapid diminution in the size of the bubo. The results of this treatment have so far been very successful, fully 80 per cent. of the cases thus treated being cured within six weeks from the date of admission. With the exception of introducing the setons, no pain is experienced, and the patient is directed to walk about as much as he pleases, to encourage suppuration.

I am unable to state whether this treatment has been used by others, but from the results thus far attained, I am free to recommend surgeons to give this method a fair trial, believing it to be a safe and satisfactory treatment of indolent buboes.

EDMUND J. DOERING,
Surgeon U. S. Marine Hospital Service.

NOTES FROM PRIVATE PRACTICE.

ARTICLE VII.

Excision of Spina Bifida Tumor—Cure.

Although this operation has apparently in this case, resulted in success, I do not report the case thinking any one will imitate my practice, but that the mistake may be avoided in similar cases.

Mrs. D., from the country, brought her child one year old to me, Nov. 24th, 1879, to get advice concerning a tumor on the child's back, in the lumbar region of spine; said they had not noticed the tumor until some time after birth; that it had grown with the growth of the child; that it gave it no inconvenience, except that pressure occasionally caused the child to cry; that it was not accompanied by paralysis of any organ or muscle.

Upon inspection, I found a tumor over lumbar spine about (2½ in.) six cm. long transversely, four cm. vertically and projecting (1½ in.) four cm. above surrounding surface and pointing somewhat upward along the spine spreading out at its base into dense, apparently infiltrated tissue. Quite a number of hairs from (½ in. to 1½ in.) one to three cm. long grew on the tumor near its junction with the back. The tumor was inelastic, non-fluctuating, incompressible in any position of the child, crying or quiet. The absence of any signs of spina bifida except location, led to its removal. Its increased size began to be a source of annoyance and the reddish appearance of the apex of the tumor caused me to fear ulceration. I imagined it to be some species of sarcoma. As the case seemed a little anomalous, I invited three other physicians to examine the case at the time of operation, all of whom concurred in the advisability of its removal. Accordingly on Nov. 25th, the child was chloroformed and an incision was made around the tumor nearly (⅞ in.) two cms. from its union with the back, to remove as much as possible of infiltrated tissue in which the tumor seemed deposited. The sensation conveyed to the knife, was as if cutting fibrous dense tissue and not adipose with which the child was abundantly supplied. From the bottom of the wound

there welled up a stream of limpid fluid, and it was at once manifest that I had opened a hernia of spinal membranes; in other words, I had to deal with a spina bifida. A ligature was put around the duct, the wound brought together by sutures, compress and bandage applied.

Nov. 26.—Found the bandages and compresses thoroughly wet, as well as several other cloths that had been applied. It was evident that the ligature had come away, and that spinal fluid was being lost in considerable quantities. The child had slept well and took nourishment as usual.

Nov. 29.—From the number of pads, compresses and cloths saturated with this now clear fluid, I judged the amount escaping must have been three pints, although the ladies in attendance assert double the amount. I have since been sorry that the quantity was not collected, as it seemed enormous. The child has lost flesh during last four days and grown pale; appetite fitful, pulse 130, temperature normal; starts some in its sleep; sutures removed, union seemed complete except at one angle, where fluid was discharging. Rubber-coated adhesive plaster was applied and compresses. Ordered (℥iss) six grams cod-liver oil and (℥i) four grams elixir calasayæ and iron, three times a day.

Nov. 30.—Found adhesive straps off and wound opened to about original size.

Dec. 2.—Have tried various kinds of adhesive plaster, but some constituents of the fluid detaches them, whether applied by heat or moisture. Ordered that the wound be dressed with carbolated oil. It has shown no disposition to heal although the amount of fluid for last twenty-four hours has considerably diminished. Child looks very feeble.

Dec. 5.—The duct probably closed yesterday, as the flow ceased and wound is contracting rapidly. Child looks somewhat brighter.

Dec 10.—Wound pretty much cicatrized and child regaining flesh and strength as rapidly as it lost it; returns home to-morrow.

The base of the tumor was cavernous, i. e., the canal leading from the spine was dilated into a cavity as large as a hazel-nut, from which there were prolongations in various directions, but

none of these extended upward into the tumor proper, or into that part of it projecting above the surface of back. It is now three months since the operation, and the child is well.

ROCKFORD, ILL. W. H. FITCH, M.D.

ARTICLE VIII.

Obstruction of Bowel, probably Intussusception, relieved by Aspiration.

Oct. 21st, 1879, was called in consultation with my friend Dr. Fowler, of Scales Mound, Ill., to visit William Bird, aged 37, an English miner. A week previous to my visit he spent the evening at a friend's house, returned home in apparently good health, and went to bed. Was taken suddenly in the night with severe pain in the bowels and vomiting. Supposing the case to be cholera morbus, or some similar disease, he took some of the usual domestic remedies, but failing to obtain relief, called Dr. Fowler, his family physician, on the following evening.

The nature of the case was at once recognized by this gentleman, who prescribed appropriate treatment.

He was shortly afterwards seen by Dr. August Weirich, of Galena, who confirmed Dr. Fowler's diagnosis of obstruction from a band or intussusception. He gradually got worse, and when I first saw him was laid in bed on his back, partly dressed, knees drawn up, the pulse was quick and small, the countenance pinched and anxious. There was constant vomiting of a greenish yellow liquid, with a horribly offensive fæcal odor, which penetrated the whole house. The abdomen was swollen and quite tender. There was distinct fluctuation and dullness on percussion over the whole course of the colon. The umbilical region gave a slightly tympanitic resonance. There was very frequent tenesmus which caused the patient to jump up constantly and strain on the vessel, the only result being a little bloody mucus.

After careful examination for hernia, which I did not find, I diagnosticated an obstruction at or near the sigmoid flexure, and proposed aspiration of the colon, an expedient which was readily agreed to by the patient and his friends.

I used the largest needle of Codman & Shurtleff's aspirator,

puncturing first in the left and afterwards in the right iliac region, drawing off a pint of liquid similar in character to that vomited, but more concentrated, the vomited matter being diluted with water taken to quench the constant tormenting thirst. I directed a seidlitz powder to be given by enema, injecting first the alkaline powder and follow it immediately by the acid. I hoped by this means (the pressure of liquid being taken off from above) to dilate and unfold the bowel, and also to obtain the sedative effect of the carbonic acid on the bowel. The material necessary was not at hand, and as I learned afterwards, the enema was not efficiently given, no plug or pad was used and the nascent gas escaped at once per anum.

Immediately after the aspiration, at 3 p. m., he declared himself somewhat relieved. The vomiting continued at longer intervals till 9 o'clock, when, under the influence of a hypodermic injection of morphia administered by Dr. Fowler, he fell asleep, and had a comfortable night.

I saw him again at noon on the 22d. He had not vomited since nine the previous night, his abdomen was natural in appearance, all swelling and tenderness had disappeared, no tenesmus, and he had more appetite than it was thought prudent to gratify. The effect of the morphia was continued, by small doses, by the mouth. His bowels moved on the third day, and he was able to be out in less than a week.

I may add, that this result was a pleasant surprise, both to myself and Dr. Fowler, and I desire to put it on record as a simple and innocuous proceeding which may be tried before proceeding to graver operations demanded by this formidable accident. Very respectfully, HENRY F. GODFREY, M.D.

BENTON, WIS., Feb. 13, 1880.

ARTICLE IX.

Was it Dilatation of Left Ventricle?

MESSRS. EDITORS:—I ask the above question and would like through your columns to get some ideas from some of your readers who take more special interest in heart troubles than I have

done. February 22d, I was called to see John H——, previously as hearty, strong and robust a man as could be found in the State. His statement was, that two days before, while chopping down pine, he began racing with another party and worked all day exerting himself to his utmost. That night he did not sleep at all but had no pain or distress; next day he went to work but was obliged to stop at noon, and went home. It was the following morning that I saw him. He presented the appearance of a person with general dropsy in the last stages of valvular disease of the heart. His legs, feet, hands, arms, and even face were as distended as they could well be; and all this effusion came on in one night only. He complained of some distress for breath. Respiration was slow, and pulse 30. I examined the heart and found but a slight murmur, or whistling sound with the second sound of the heart. The heart's action was labored but regular, the left ventricle taking a long time to contract. Pulse although only 30 per minute, was very full and strong. I could count it by watching the tremor or jar of the whole arm. I put him on syr. iodide of iron; also gave iodide of potassium. For diuretics used pot. nitrate and pot. acet. on alternate days; used calomel and jalap as hydragogue cathartic each night. Under this treatment the third day the pulse was 45; sixth day 58, gradually improving until to-day pulse is 70, with but slight anasarca towards evening. I have examined no less than twelve different authors on cardiac diseases and cannot thus far find a similar case, and in fourteen years practice I have never seen anything resembling it. I had good counsel in the case, and it was also new to the gentlemen summoned.

K. J. THOMAS, M.D.

GREENWOOD, WIS., March 12, 1880.

THE editor of the *Journal of Nervous and Mental Diseases* will pay seventy-five cents each for copies of the first issue of that publication—January, 1874. Address, Dr. J. S. Jewell, 70 Monroe Street.

Society Reports.

ARTICLE X.

BRAINARD DISTRICT MEDICAL SOCIETY met in Mason City, Illinois, January 22, 1880. Present, Drs. H. B. Brown, C. H. Norred and R. M. Wilson, of Lincoln; Dr. S. T. Hurst, of Greenview; Dr. J. D. Whitley, of Petersburg; Dr. Ch. B. Maclay, of Delavan, and Drs. J. P. Walker, A. M. Bird, W. P. Walker, J. W. Spear and J. A. Walker, of Mason City. The president, Dr. Newcomer, being absent, Vice-President Whitley presided.

The constitution and by-laws, amended at a former meeting, were read by Dr. Wilson, chairman of committee, adopted and one hundred copies thereof ordered printed.

Dr. Whitley presented a supplementary report and photograph of a case of pleuritis requiring operation, reported at last meeting. Secretary instructed to forward Dr. Whitley's case and photo. to CHICAGO MEDICAL JOURNAL AND EXAMINER.

Dr. S. T. Hurst reported an interesting case of hydrocele, treated by tapping. On tapping the third time, found his hydrocele had become an hæmatocele. After evacuating, he thoroughly kneaded the scrotum, and sent the patient home. Complete recovery in three weeks, without any further treatment.

The afternoon session was devoted to the discussion of scarlatina, participated in by nearly all of those present. Dr. Whitley spoke very strongly in favor of the sulpho-carbolate of soda as a prophylactic; had seen very marked proofs of its value in his own practice.

Scarlatina will be the special subject for discussion at next meeting, April 22, 1880, at Mason City, Ill,

J. A. WALKER, *Secy.*

Domestic Correspondence.

ARTICLE XI.

PHILADELPHIA LETTER.

Editors of the CHICAGO MEDICAL JOURNAL AND EXAMINER:

The annual commencement of our two medical schools is a matter of general public interest as well as the event of the year in professional circles. Philadelphia is a small city, whatever may be the number of inhabitants which the census allows her. The intelligent, thinking portion of the community is far more compact and homogeneous than in most American cities of the first class, and any event of an academic nature is a topic of general interest and town-talk. On the morning of commencement, in either of the schools, the neighborhood of the Academy of Music, which is in the center of the city, presents a lively appearance. Flowers in bouquets, baskets, horse-shoes and what-not forms, mysterious packages of various kinds, the anonymous gifts of friends and relatives of the graduates, are handed in at the doors in great quantities. Towards noon the streets in the neighborhood—even gay and crowded Chestnut street, show a more festive aspect, and groups and parties of ladies, all pressing in the same direction, show that an event of general public interest is about to transpire. When one arrives at the door of the building, knots of students are found gathering about while waiting in the large ante-room known as the "foyer," the graduates are assembled, clad in the Oxford academic gown and "mortar-board" hat, and looking, it must be admitted, as well as they ever did in their lives. At one end of the foyer, the trustees, faculty and alumni gather, and there may be seen—I

speak of the University now—a group of prominent and public-spirited men, former merchants for the most part, but men of education whose grey and venerable heads are always to be seen in public assemblies when the common weal is to be forwarded. Probably none of these gentlemen is better known than our late Minister to England, the Hon. John Welsh, whose suave and agreeable presence lends an element of refinement to any gathering. Among the medical men one may see Stillé, whose clear-cut features, high forehead, and white beard, make him a conspicuous object in his velvet gown. I fear this is his last appearance in the procession of commencement day, for I understand that his resignation, presented last year and withdrawn again at the urgent solicitation of the friends of the University, has now been irrevocably determined upon. Agnew, Professor of surgery and rival of Gross in ability as a teacher and in popularity among the students, is also conspicuous from his tall, somewhat stooping figure, fine, bald forehead, surrounded by a fringe of snow-white hair, and with a heavy, white moustache. I believe this exhausts the list of white heads in the University, for we have a young faculty. Pepper, Professor of Clinical Medicine, has a small, light figure, and almost youthful face, of extremely quick and mobile cast, and showing the active brain, never for an instant at rest. Horatio Wood, Jr., is scarcely older-looking, although his full, black beard gives him a more mature look, and, like Pepper, every movement shows the active mind. Looking at him, one can understand the almost morbid craving for work which could induce a man who had written a work on therapeutics, published an investigation on "Fresh Water Algæ of the United States," in the "Smithsonian Contributions to Knowledge," thrown off a "Boylston Prize Essay" and a popular magazine article simultaneously, while at the same time attending to a considerable practice, hospital and private, and delivering a course of lectures as Professor in the University—not to speak of editing a medical journal, to complain bitterly that he was "rusting for want of occupation." Goodell, the obstetrician, whose fine, portly figure and head, with his full brown beard, gains additional picturesqueness from his academic costume, and Norris, the ophthalmologist, are conspicuous figures. Among the other members of the faculty

who are in all probability known by reputation to your readers, is Duhring, the dermatologist, and Harrison Allen, professor of physiology, who is the orator of the day—the valedictorian. The procession takes its line of march through the corridors to the stage, and the 111 graduates take their seats in the body of the house, directly in front. Looking from the stage, the sight is a very impressive one; the huge Academy, holding some three thousand persons, is packed tier above tier to the roof, and presents a most brilliant spectacle.

But I will not weary your readers by relating the incidents of a medical commencement, with which they are in all probability extremely familiar. Before the ceremony had begun, I took occasion to scan the list of graduates, and noted the titles of the thesis in each case, marking those which seemed likely to gain distinction. I should say here that various prizes and distinctions, to the number of about sixteen, marked the standing of those who took the honors. I was surprised, when listening to the list of awards, to observe how many of my surmises had proved correct. The subjects of these theses were such as the following: "The Depressor Nerve," "Reparatory Inflammation in Arteries after Ligation," "Physiological Action of Eucalyptol," etc., showing that the effort to study carefully some one subject had resulted in making a worthy contribution to medical knowledge. The unfortunate wight who expects to astonish the world with his original views on "Diphtheria," or "The Origin of Yellow Fever," is apt to be much disappointed at not hearing his name when the honor-list is read at commencement. The valedictory by Prof. Allen was a brief review of the recent progress of medical science, with allusion to the increasing field for public usefulness constantly opening before the profession, as the community at large appreciates more and more the advantage of trained scientific knowledge.

The commencement of the Jefferson Medical College which took place a day or two ago was also a very successful one, although somewhat saddened by the thought that the poet valedictorian of last year, Prof. J. Aitkin Meigs, had since died. A large class, 196 in all, graduated; not quite so many, however, as in previous years. An addition to the faculty has been

announced, Dr. Willliam Thompson having been chosen Honorary Professor of Ophthalmology.

The Pennsylvania Hospital situated in the heart of the older part of Philadelphia and worthily renowned for the skill of its surgeons, has always been the center of Philadelphia surgery. It is a pity that more has not come from the advantages enjoyed by the surgeons connected with this hospital, but it must be confessed that except for the admirable clinical lectures which are delivered there twice a week to students from both schools, the profession has not greatly benefitted by the experience of its surgeons. About twelve years ago the publication of a yearly volume of "Hospital Reports" was projected and carried out as far as two volumes, the further publication ceasing for want of funds. The two handsome volumes which remain as relics of this abortive attempt to render the experience of the hospital of general avail, may still be found in the book shops of the city or occasionally bought at auction for a trifle. They contain some very good papers. Recently the surgeons of the hospital have decided to make use of some at least of the valuable material which had accumulated for many years and have published a volume entitled "Surgery of the Pennsylvania Hospital," edited by Drs. Thos. George Morton and William Hunt. This is an octavo of some 350 closely printed pages containing an epitome of the practice of the hospital since 1756; including collections from the surgical notes and an account of the more interesting cases from 1873 to 1878; with some statistical tables. The record of the surgery of the hospital includes 1011 amputations performed in the last fifty years. Of these there were eight of the hip-joint. The rate of mortality for the entire number was 24.43 per cent. The method employed in the treatment of cases, the form of operation preferred, etc., with various tables are given. Following this there are accounts of the various forms of disease and of certain operations performed by the surgeons, giving a mirror of the practice of the institution and containing much that is practical and suggestive. Dr. Morton gives a description of a curious "painful affection of the foot," when the fourth or occasionally the third metatarso-phalangeal articulation is affected by severe pain usually brought on by long walking but occasionally appear-

ing spontaneously, intense in character, "cutting to the heart," accompanied by faintness and cold sweat. There is absolutely no external symptom. Usually the feeling is that of the bones being dislocated but no dislocation can be perceived. Dr. Morton attributes the affection to a bruising of the filaments of the digital branches of the plantar nerve by the contact of the fourth and fifth metatarsal bones.

When this form of neuralgia has been caused by injury, local treatment, rest and anodyne applications may be used; a broad low heeled shoe lacing up the front should be worn. A narrow flannel bandage applied around the foot so as to firmly but moderately support the toe and prevent rolling or friction of the joints is also useful. But in severe cases no treatment except excision of the metatarso-phalangeal articulation, or amputation of the toe with the removal of the joint in question will likely be of any service. The cases subjected to operation all do well and there is no return of the neuralgia. An interesting case where section of the sciatic nerve was performed for elephantiasis arabum of the leg with a certain amount of success is recorded. I am tempted to make a number of excerpts from this volume which is full of interest and practical value, for I think it hardly likely to be seen by many of your readers. But I must content myself by pointing out several features of practical value. The methods of treating fractures employed in the hospital and especially those which are peculiar to it are given at some length and various forms of apparatus are figured. In fact one of the features of the book is the frequent description of procedures peculiar to the locality, "little dodges" and "wrinkles" employed by the surgeons and instruments devised by them. I am not writing a criticism on the the work and so shall not allude to its short-comings. It reminds me of the chat of the consultation room rather than the systematic description of disease and treatment. I venture to call the attention of your readers to the work, being quite sure that it will be found to contain much that is new, and to be rich in practical suggestion.

I believe that in Chicago you are quite ahead of us in all matters relating to public health, and that we have nothing new to tell you upon that point. But it may interest your readers to

know that the general impulse which has of late been given to sanitary science has affected the community of this city. Our board of health is almost equally composed of honest hard-working competent physicians and crafty politicians. The result is a constant struggle between the powers of good and evil which is as undecided in its limited sphere as in the world at large. Just now the medical men appear to have the upper hand, and one or two minor reforms have been made which have increased decidedly the comfort and health of our citizens. One of these is the proper cleansing and ventilation of our street-cars. All Philadelphia rides twice a day in the cars which run in all our streets small and large, and that these cars should be decidedly comfortable and healthy is in the highest degree desirable. But there has been no means of ventilating these vehicles until recently a stove has been devised which stands half inside half in front of the car for the comfort of the driver. A constant current of fresh air passes around this stove, heating and ventilating the car at the same time. The time-honored custom of strewing hay to the depth of a foot or more over the bottom of the car has also been stopped by order of the board of health. No one who has not experienced it can guess the disgusting condition of this hay. Trodden under foot by dozens of filthy feet, defiled by constant expectoration of tobacco juice or even of diseased saliva, the mass of reeking foulness must be waded through by all, even refined ladies, to whom it became in time a sort of torture to enter these vehicles. In addition as the augean conglomeration of filth became tramped over, at the end of a trip fresh hay was piled on top, and the rotting mass left to decompose beneath. We thank the board of health for relief from this plague from the bottom of our hearts. A positive measure of public benefit which is also to be carried out is the establishment of public baths in various parts of the city. In a future letter I shall describe these to you at length.

PHILA.

ARTICLE XII.

Editors CHICAGO MEDICAL JOURNAL AND EXAMINER:

In my article on the gynæcology of the seventeenth century, I said in conclusion that one would be led to think the Dr. Courrade must have known and used the speculum because he described so accurately granulations, ulcerations, etc., of the collum uteri. But I certainly did not mean to convey the impression that the speculum was unknown up to that time, and consequently a product of much more recent inventive genius. I meant only that it was eclipsed in the general darkness of mediæval times. The speculum (*speculum ani et vaginæ uteri*) was known long before the Christian era. Ætius, who flourished in the sixth century A. D., and Paul of Ægina, his successor, describe the instrument and its uses distinctly, and specula have been unearthed from various ruins, including a bivalve, which is now preserved in the Museo Borbonico.

"Probably all wit and all wisdom have often been fully explored and again quite forgotten," said Aristotle two thousand years ago, and it is doubtless true.

It is to be regretted that so little attention is given now-a-days to the history of medicine. It is possible that our pride might sometimes be mortified in the presence of facts, which were worn out and thread-bare when Arabians, Egyptians, Greeks and Romans were in their glory, and which to the modern world are, to say the least, not fully understood.

Notwithstanding what I have said above about the speculum as being a product of classic genius and an important factor in the present *renaissance*, it is nevertheless my firm conviction that, with the evolution of the sense of touch, the speculum, except for strictly surgical purposes, will be regarded as a relic of barbarism, and that he will be a poor diagnostician who will not be able to come to a correct conclusion concerning os-uterine and vaginal conditions by the aid of the sense of touch alone. In fact, I think we might now save a good deal of physical, to say nothing of moral torture, by trusting more to digital, which, in the light of modern psychology, means mental impressions.

CHICAGO, March 3, 1880. DR. JAMES I. TUCKER.

Reviews and Book Notices.

ARTICLE XIII.—PHOTOGRAPHIC ILLUSTRATIONS OF SKIN DISEASES. By GEO. HENRY FOX, A.M., M.D., Clinical Professor of Dermatology, Starling Medical College, Columbus, Ohio, etc., etc. *Part* 5. Eczema Infantile; E. Papulosum; E. Ichorosum; E. Pustulosum, and E. Squamosum. *Part* 6. Eczema Barbæ; E. Manum; E. e. Venis Varicosis; Ulcus Varicosum; Psoriasis Annulata.

The lately published parts of this admirable atlas of colored skin portraits, are fully equal in merit to those which first were placed in the hands of the profession, and which gave promise of so much in the future. We have heretofore had occasion to notice the latter with an expression of our approval and pleasure. If any one who happens to inspect them, feels inclined to take exception to the contrast between the symptoms exhibited by the art of the photographer and those portrayed by the skill of the lithographer, he should remember that, after all, the photograph exactly represents the phenomena, color excepted, and that the classical symptoms displayed in several of the chromolithographs are, as a matter of fact, rarely seen in the consultation-room of the practitioner or in the clinic of the college or dispensary.

In the portrait of eczema of the palm, the character and extent of the skin infiltration is admirably shown; but one of the best of this series is the portrait of eczema of the beard, which is so truthful that one with little experience in these matters, could almost make a differential diagnosis between the disease represented and that produced by either a vegetable parasite or constitutional syphilis.

We congratulate the author, and his co-laborer in the matter

of coloring, Dr. J. Gaertner, upon the success which they have attained not only on paper, but in the large demand for the work which the publishers have been sufficiently fortunate to satisfy.

J. N. H.

BOOKS AND PAMPHLETS RECEIVED.

A System of Medicine. Edited by J. Russell Reynolds, M.D., F.R.S., with Numerous Additions and Illustrations by Henry Hartshorne, A.M., M.D. In three volumes. Vols. I and II received. Philadelphia: H. C. Lea. 1879.

The Causes and Results of Pulmonary Hæmorrhage with Remarks on Treatment. By Reginald E. Thompson, M.D. London: Smith, Elder & Co., 15 Waterloo Place. 1879.

The Hypodermic Injection of Morphia; Its History, Advantages and Dangers. By H. H. Kane, M.D. New York: Chas. L. Bermingham & Co. 1880.

Annual Report of the Supervising Surgeon-General of the Marine Hospital Service of the United States, for the Fiscal Years 1878 and 1879.

Proceedings of the Louisiana State Medical Association at its Second Meeting, Held in the City of New Orleans, April 9th, 10th and 11th, 1879, with the Constitution and by-laws.

Mansill's Almanac of Meteorology and Planetary Phenomena, for the Year 1880: and New System of Science. By Richard Mansill, Rock Island, Ill. R. Crampton, Publisher. 1880.

On the Internal Use of Water for the Sick, and on Thirst. A Clinical Lecture at the Pennsylvania Hospital, October 25, 1879. By J. Forsyth Meigs, M.D. Philadelphia: Lindsay and Blakiston. 1880.

Transactions of the Wisconsin State Medical Society, for the Year 1879, with its Constitution and By-Laws. Vol. XIII; 1879.

Transactions of the Medical Association of the State of Missouri, at its Twenty-second Annual Session, held in Columbia, Mo., May 20 and 21, 1879.

Transactions of the American Ophthalmological Society; Fifteenth Annual Meeting. Newport; 1879.

Primer of the Clinical Microscope. Boston Optical Works. By Ephraim Cutter, M.D.

Pacquelin's Thermo-Cautery with Wilson's Antithermic Shield in Epithelioma of the Cervix Uteri. By H. P. C. Wilson, M.D., Baltimore, Md.

Malignant Degeneration of a Fibroid Tumor of the Uterus. Large, False Aneurism in the Substance of the Growth. Drs. Albert N. Blodgett and Clifton E. Wing, Boston.

State Medicine and State Medical Societies. By Stanford E. Chaillé, A.M., M.D., New Orleans, Louisiana. Extracted from the transactions of the American Medical Association.

The Fallacies of Popular Clinical Medicine, an Introductory Lecture delivered at the Long Island College Hospital, Brooklyn, New York, February 5, 1880. By Jarvis S. Wright, M.D.

The New Anæsthetic—The Bromide of Ethyl. By R. J. Levis, M.D., Surgeon to the Pennsylvania Hospital, etc.

First Annual Report of the Central Board to the Philadelphia Society for Organizing Charitable Relief and Repressing Mendicancy. October 1, 1878.

The Second Annual Report of the Presbyterian Eye and Ear Charity Hospital, Baltimore, Md., for the year of 1879.

Report on the Revision of the U. S. Pharmacopœia, Preliminary to the Convention of 1880. By Charles Rice, Chairman of the Committee. New York: 1880.

NEW TREATMENT OF DIPHTHERIA.—M. A. Cornilleau. (*Rev. de Thér. Méd. Chir.* and *Rev. Méd.*, Jan. 24, 1880.)

The attention of the profession is called to the treatment of diphtheria with oxalic acid and oxalate of potassium.

The author's formula is as follows:

		Grams.	
Pure oxalic acid	(ʒj)	1	50
Infusion of green tea	(℥iv)	120	
Syrup of bitter orange peel	(℥j)	30	

to be taken in dessertspoonful doses every three hours.

In addition, to be taken every hour, a teacupful, more or less, according to the age, of the following:

		Grams.
Fresh sorrel leaves	(℥v)	150
Boiling water	(℥xxx)	1000

To be sweetened at time of giving.

Speedy amelioration of the symptoms is observed under this treatment, convalescence being established generally at the end of a week.

The author has also found benefit from its use in croup. The dried leaves may be used when the fresh are not procurable.

Editorial.

THE CODE OF ETHICS OF THE MASSACHUSETTS STATE MEDICAL SOCIETY.—Until recently the Massachusetts State Medical Society had no formal code of ethics. Some of the more important practical items of the general code were incorporated into the by-laws of the society. During the last year, however, the propriety of adopting a more full and distinctly expressed code of ethical rules, has engaged much of the attention of its members. The discussion was ended at a recent meeting of the society by the adoption of a concise set of ethical rules, specially adapted to the organization of the society, and in several places referring to particular sections of its by-laws.

As the Massachusetts Medical Society is one of the oldest and most respectable medical society organizations in this country, we are glad she has formally adopted a code of ethics, thereby acknowledging the propriety and value of some clearly expressed written rules for the guidance of members of the profession in their relations to each other, and to their patients. It has been quite the custom of some occupying prominent positions in the profession, to sneer at the idea of a written code of ethics, claiming that it was derogatory to the dignity of an honorable profession to acknowledge anything beyond the *golden rule*.

Such, however, take a very narrow view of the subject, apparently seeing in the code, nothing but a system of penal rules. They do not seem to comprehend the fact that a written code is not only designed as a rule of conduct, but an exposition of the true relations of the members of the profession to each other, to their patients and to the community, by the reading of which many honest, plodding, well-meaning members, are enlightened

and their views of duty made more clear and elevated; many less scrupulous are restrained; and in cases of doubt and disagreement, all have a tangible, uniform standard for their guidance. Then we say again that we are pleased with the action of the Massachusets State Medical Society, more especially as the code it has adopted, so far as it goes, differs in no important particular from the provisions concerning the same topics, in the National Code, so generally adopted by the medical societies in this country. To satisfy the curiosity of our readers, we give below the Massachusetts Code as published in the Boston *Medical and Surgical Journal:*

(Adopted by the Councilors, February 4, 1880).

Object of a code of ethics. The Massachusetts Medical Society is designed to secure to the public a body of well educated and otherwise trusty physicians. Its code of ethics is intended to furnish certain principles and rules of action for their guidance and convenience.

I. The relation of the physician to medical science. A physician should lend his influence to encourage sound medical education, and to uphold in the community correct views of the powers and the limitations of medical science and art.

II. The relation of the physician to medical business. The professional success of a practitioner depends upon qualities connected with his moral character, his scientific attainments, and also his industry and business talent. But the relation of practitioners of medicine to families and households is not like that of tradesmen to their customers. The kind of competition which might be considered honorable in business, cannot exist between physicians without diminishing their usefulness and lowering the standard of the medical profession. (See IV, Sec. 1; V, Sec. 1).

III. The relation of the physician to his patients. The first duty of the practicing physician is to his patient, who has a right to expect that his disease shall be thoroughly investigated and skillfully treated, with charitable consideration for his mental peculiarities or infirmities, and in a relation strictly confidential.

1. The physician should not make unnecessary visits. He should neither permit needless apprehension nor fail to give seasonable notice of danger.

IV. The relation of the physician to other practitioners and to their patients. In his relations with another practitioner and his patients, a physician should be governed by strict rules of honor and courtesy. His conduct should be such as, if universally imitated, would insure the mutual confidence of all medical practitioners.

The foregoing rule should be a sufficient guide of action. Some of the following contingencies will illustrate its application:

1. A physician should take no step with a view directly or indirectly to divert to himself the patients or practice of another physician.

2. If formally requested to assume charge of a patient or family, usually attended by another physician, he should consent to do so only after notifying the latter, unless the case be one of pressing necessity.

3. If a physician is called to a patient during the temporary absence or illness of the usual physician, or in the case of accident or other emergency, he should direct that the former be sent for as soon as he is able to take charge of the case, and should then relinquish it to him. It is generally agreed that, among several physicians thus called, he who first arrives shall act, unless the family designate another.

4. A communication from the temporary to the usual physician, in the absence of the latter, should be written and sealed, and not simply verbal.

V. The relation of the physician to quackery. In every community there are minds naturally inclined to quackery, which has flourished in every age. It grows by being noticed, and thrives best under opposition. It is commonly unwise to employ argument against it. But a physician should lend his influence to establish a distinct line between the regular practice of medicine and the practice of quackery, and should avoid any act which might tend to weaken such a distinction either in the professional or in the public mind.

1. Thus, he should not consult with an irregular practitioner (*see By-Laws*,) nor countenance the use of secret remedies, nor be interested in medical trademark preparations; nor give certificates recommending mineral waters, patents, or medical prepara-

tions, or the like; nor give a commission to an apothecary, nor receive one from him; nor advertise himself or his practice in public print; nor publicly advertise advice or medicines to the poor, etc.

VI. Consultations should be encouraged in cases of unusual responsibility or doubt.

A consultation is called for the benefit of the patient, and to give him the advantage of collective skill. Should there be a difference of opinion, discussion should be temperate and always confidential.

A consulting physician should be careful to say or do nothing to impair the confidence of the patient or his family in the attending physician.

1. See, for guidance of a consultant, IV, Secs. 1, 2, 3, 4.

2. At a consultation punctuality is important; and non-arrival within fifteen minutes after the appointed time should be interpreted as non-attendance.

3. For the advantage of the patient and for economy of time, it is well in a consultation to observe a certian order of business. The following has been found convenient:

The attending physician, having stated in general terms the nature of the case, may then call, in turn, upon each consultant, if there be more than one, to examine the patient,—the usual order being that of seniority. No consultant should make an examination or inquiry out of turn. On retiring, the attending physician may invite, in the usual order, the opinion of each consultant, who should not be interrupted while giving it; after which he may add his own. In conclusion, a course of action may be agreed on, or the attending physician may be left to act at his own discretion.

VII. Fees. A fee-table has a local application, and is designed to indicate a fair or average amount due for services. But if the patient fully understands it beforehand, a physician is at liberty to place any value he sees fit upon his services. It is then at the patient's option to decline them or to pay the price. A physician should be considerate of the poor.

1. A patient in moderate circumstances should not be called upon to pay a fee unusually large for the service rendered, with-

out a previous explicit understanding. A physician, if able, should offer to pay the medical attendant of himself or of his family. Unless by special agreement, a physician attending or acting for another should receive the fees. Among obstetricians a rule obtains that the interval between the birth of the child and the placenta halves the service and the fee. A fee should be charged for a medical certificate or paper of value to the applicant, connected with, for example, absence or exemption, life insurance, pension papers, etc., except the usual certificates of vaccination and death.

VIII. Seniority. Seniority applies rather to duration of practice at the place in question than to age.

COLLEGE SOCIABILITY.—One of the most pleasant social occations enjoyed by students during the present college year, was the union of the senior classes of the several departments or colleges of the Northwestern University, better known as the Chicago Medical College, the Union College of Law, and the College of Liberal Arts, at the residence of Dr. and Mrs. N. S. Davis, in Evanston, on the afternoon of the 13th March, last. After partaking of a bountiful lunch and enjoying an hour or two of free social intercourse, the company repaired to the University campus, examined the different buildings, including the Woman's College and the Theological school, and were received at the University Hall by President Marcy, aided by Professor Carhart, shown through the museum and into the library, where they tarried long enough to enjoy some impromptu sentiments and responses from representatives of the three classes. At the Woman's College the party enjoyed some excellent music, after which the law and medical classes returned to the city, highly pleased with their afternoon's entertainment.

MEDICAL COLLEGE COMMENCEMENTS.—We give in this number an account of the commencement exercises of the Rush Medical College. Those of the Medical Department of the Northwestern University, better known as the Chicago Medical College, do not occur until March 30th, and consequently will not be noticed until our next issue.

MRS. ASTOR'S PRESENT TO THE NEW YORK ACADEMY OF MEDICINE.—On the 15th of January last, Mrs. Augusta Astor presented to the New York Academy of Medicine, a costly and beautiful gift, in the form of a "loving cup." We are indebted to the kindness of the publishers of the N. Y. *Medical Record* for the annexed figure, which well represents the artistic finish of the original.

We have not reproduced this illustration without a purpose. When the wealthy and cultivated citizens of our great metropolitan centers are ready to exhibit their sense of what the medical organizations in those centers are actually accomplishing, when they learn to appreciate the character of their representative men and are prepared to give evidence of that appreciation in their generosity, that is a good day for the citizens of any metropolis. Medical men in America are by no means the "social Pariahs" which our English friends have lately been called by one of their

own number. They are in no sense, either beggars or paupers of the commonwealth. Industry, sobriety and even an ordinary degree of skill in the performance of their professional duties, are rewarded here with that comfortable and competent income which is far removed from the average of the immense majority of men.

The medical men of our land, and the medical institutions they have in charge, deserve well of the wealthy and cultivated classes. The incalculably large measure of charitable work performed by the profession in this country, probably represents a greater amount of unpaid labor than is to be found in any other field of human activities. The recognition of this, on the part of those who, whatever their wealth or social position, cannot fail to be indirectly benefited by it, is to us, a touching and grateful as well as graceful tribute. When some of the professorships in our medical colleges are properly endowed, and the scientific associations of medical men, are made the recipients of bequests intended to enlarge their powers of usefulness and their influence among all classes of society, then we shall have the solution of several problems which are now vexing the medical world.

We congratulate our brethren in New York, far more upon this evident recognition of their position as Academicians, than upon the gift they have received, costly and elegant though it be. And in reproducing the beauty of its exterior in these pages, we are not without the hope, that the time is near when some of the several medical associations of this city, shall in their own fireproof place of meeting, be made the recipient of a gift, which, even though it be not a "loving-cup," shall help to unite their members in the sympathy begotten of an earnest effort in an honorable and common cause.

IF any of our subscribers can, conveniently, send to the address of Dr. E. L. Holmes, 119 South Clark st., copies of the CHICAGO MEDICAL JOURNAL for November, 1866, and for August, 1867, they will confer a great favor.

Notes and Extracts.

INVESTIGATIONS CONCERNING THE QUALITY OF THE WATER SUPPLY AT MEMPHIS AND OTHER PLACES IN TENNESSEE AND MISSISSIPPI, UNDER THE DIRECTION OF THE NATIONAL BOARD OF HEALTH.

Having long been satisfied that our ability to prevent or limit the progress of epidemic as well as endemic diseases, will depend mostly upon the extent and accuracy of our knowledge concerning the local sanitary conditions existing where such diseases prevail, we were especially gratified to find that among the several important lines of inquiry, instituted by the National Board of Health, was one for examining the quality of the water supply in many of the places in the lower Mississippi Valley, in which yellow fever prevailed in the summers of 1878 and '79. The work has been prosecuted with considerable zeal, under the direction of Dr. Smart, whose report on the subject we give below, copied from "Supplement No. 3," of National Board of Health Bulletin.

While the investigation is by no means complete, and the report gives only sanitary results, instead of detailed analyses, it is quite sufficient to show that both the soil and the water supply of Memphis and many other places named in the report, are largely impregnated with organic matter highly pernicious to the public health. It is not at all difficult to understand why a population using such water, and breathing the emanations from a soil so impregnated, should be subject to severe epidemics in seasons of high temperature, and to a high ratio of mortality at all times. We say a high ratio of mortality at all times, because it is a great mistake to suppose that a soil impregnated with sewage

matter and water contaminated, exert an influence only on special epidemics. On the contrary, such circumstances occasion a greater aggregate amount of sickness and mortality by increasing the number and fatality of attacks of ordinary diseases than by special epidemics. For instance, in turning directly to the table showing the weekly mortality of different cities in the United States, that for the week ending February 28th, for instance, we find the number of deaths for each 1,000 of the population, to be, in Boston, 23.1; Providence, 21.4; New York, 25.7; Philadelphia, 17.0; Baltimore, 14.4; Cincinnati, 17.3; Chicago, 16.4; Louisville, 12.3; Memphis, 37.3.

The following is the report, which will not only repay for the time of perusal, but will be useful for reference hereafter:

REPORT OF DR. CHARLES SMART.

WASHINGTON, D. C., Dec. 30, 1879.

SIR: I have the honor to submit the following report of the practical results of my analysis of the water supplies of certain towns and villages in Mississippi and Tennessee.

My instructions did not require an exhaustive chemical analysis of the various waters with the quantitative determination of the saline matters which might be present in them. There was contemplated only what has been called a *sanitary analysis*, an investigation into the question of wholesomeness or unwholesomeness. But as a water which is unfit for potable uses from excess of metallic, earthy, or alkaline salts can usually be detected by its taste or hardness, a sanitary examination becomes practically an investigation into the organic matter which is contained in the sample.

The presence of organic substances can easily be detected in most waters, for there are few which are organically pure; but there is no royal road to the estimation of the quality, nor to—what is of as much importance—an appreciation of the quality. The examination must consist in instituting a series of experiments on the organic matter, on the substances which accompany it in the water, and on those derived from it. These various witnesses are, as it were, interrogated, and from a consideration of their testimony an opinion is formed as to the quantity of the

organic contamination, as to its origin in the animal or vegetable kingdom, as to its source, whether near or remote—in a word, as to the wholesomeness or unwholesomeness of the water which contains it.

The examination being of necessity complex, and each point susceptible of determination by different processes, all of which have their advocates, a consultation was held with Prof. Ira Remsen and Dr. Harmon K. Morse, of the Johns Hopkins University, concerning the ground to be covered by the examination in each instance and the best mode of accomplishing it, consistent with portability of apparatus and other considerations. I am especially indebted to these gentlemen for calling my attention to Tiemann's modification of Schulze's process for the estimation of nitrates, which they have used for some time in their water examinations, and the accuracy of which they have practically determined.

The experimental points decided upon as essential were—

First. The total solids as obtained by the balance after the evaporation of a given quantity of water;

Second. The separation of this total by ignition and the balance into substances dissipated by heat, such as organic matter, nitrates, etc., and the inorganic residue;

Third. An estimation of the amount of oxygen required to oxidize the oxidizable substances present in the water, as affording a view of the organic matter from one side; while a view of the same impurity was to be obtained on another aspect by—

Fourth. The break-up of the organic substances and estimation of their nitrogen in the form of albuminoid ammonia;

Fifth. The quantity of free ammonia present;

Sixth. That of nitrous acid;

Seventh. Of nitric acid;

Eight. Of chlorine; and,

Lastly. The microscopic appearance of the sediment.*

With these data and a knowledge of what might be termed the natural history of the water, whether rain, well, spring, river

* Statistics of morbility and mortality, as gathered by the house-to-house inspection, were so largely matters of memory and not of record that they are not thought worth presenting in this connection.

water, etc., and of its surroundings, it was conceived that an accurate opinion could be given as to its quality, not by the operator only, but by any one conversant with the processes of water analysis, no matter what the method he adopted in the formation of his opinion.

In accordance with instructions, I proceeded to the town of Jackson, Miss., which I found mainly supplied by rain-water collected and stored in underground cisterns. As the time at my disposal did not admit of the examination of a sufficient number of these waters to enable an opinion to be given in general terms upon the character of the supply, I approximated to a generalization by selecting—

First. Water supplying public institutions, such as State penitentiary, the deaf and dumb asylum, the institute for the blind, etc.

Second. Public or semi-public cisterns.

Third. A few samples from the cisterns of well-to-do citizens.

Fourth. A few from those of the colored people.

Fifth. Samples from houses in which there was or had recently been malarial remittent fevers.

Thirteen samples were furnished and analyzed, with the following results:

	Cisterns.	Water good.	Water fair.	Water bad.	Sewerage
Sound	2	.....	1	1	.....
Spring	3	1	1	1	.....
Leaky	8	4	1	3	.....
Total	13	5	3	5	.....

This is manifestly a bad showing—only two sound cisterns out of thirteen, one containing water rank with vegetable impurity, while the contents of the other are not above suspicion. That the cisterns are not contaminated with sewage matter is owing to purity of soil, and not to their own merits. Several of them are neither more nor less than shallow wells, receiving more of their contents by percolation than by inflow from above.

One well-water, from northwest Jackson, was received for

examination. It was organically impure, even had its use not been contra-indicated by the amount of its earthy constituents.

Having been informed by Dr. Wirt Johnston, secretary of the State board of health, that during the 1878 epidemic of yellow fever the disease passed from Jackson eastward along the line of railroad and ravaged all the settlements along the track to Meridian, except the village of Brandon, I proceeded to that place and secured samples from the sources of supply most generally used. These consisted of three wells, two springs and one cistern. The last was sound, but contained bad water. The springs were good, but one (Youst's) would have been better had the arrangements for preserving it from surface admixture been other than of the most primitive character. Of the wells one furnished good, another fair or usable, and the third an impure water.

The next place at which my instructions called for an investigation was Grenada, Miss. Here the supply was found to be from wells averaging about twenty-five feet in depth. They were all free from excess of any earthy salts.

Eighteen samples were examined, of which fourteen were good waters, one fair and three bad. Of the last, one (Doak's) would probably have shown as a good water had a fair specimen been furnished for analysis. On investigating the well, after examination of the water, it was found that a new pump had been inserted on the day before the sample was collected, and that the well was unusually turbid from this interference. The two remaining on the record as bad waters were undoubtedly contaminated with sewage.

The comparative freedom of the wells in this town from sewage infiltration is owing to the absence of privy vaults. The Mississippi State Board requires the use of dry earth and surface receptacles, and Grenada has been very thorough in her adoption of this surface system.

For samples of the supply of small country settlements I proceeded from Grenada to Duckhill, Miss., where I examined three wells, the waters of which were good, although possessed at times of a sulphur taste on account of a blue-clay stratum which lies below the water-mark.

Returning from this place to Grenada, I collected at Elliott, Miss., samples from three wells, two of which were good and one bad.

At Payne's place, which is finely situated from a sanitary point of view, but which furnished twenty-five cases and thirteen deaths out of one hundred people living there during the 1878 epidemic, I obtained samples from two cisterns and one well. The latter furnished excellent water, but both cisterns, although sound, contained very impure supplies.

At Green's Chapel, the only well yielded a very satisfactory water.

If the above samples from country places can be admitted as illustrations of the well-water supply of such settlements generally, their freedom from organic impurity, from surface washings and sewage, is a matter for congratulation.

Grenada and its vicinity is thus seen to have an excellent water supply, the impurity in the few bad cases being due to local and preventable causes.

At Holly Springs, Miss., where examinations were next required to be instituted, twenty-five waters were analyzed, of which eighteen were from wells, five from underground cisterns, and two from springs.

The following tabulates the results:

	Cisterns, etc.	Water good.	Water fair.	Water bad.	Sewage.
Sound	3	3	.....	.....	.....
Siping	1	1	.....	.....	.....
Leaky	1	.....	.....	1	.....
Wells	18	9	2	3	4
Springs	2	1	.....	1	.....
Total	25	14	2	5	4

Of the wells contaminated by sewage in this town, some are owing to pollution of soil by privy vaults now disused; one arises from the neighborhood of a vault which is yet in use, another from the immediate proximity of a cow-stable, combined with a break in the curb which admits of surface inflow in wet weather.

Some of the bad waters can have the organic matter contained in them accounted for only by the presence of large trees, the roots of which may lead surface water into the well with insufficient filtration, or, being in a state of decay, may charge the inflowing water with their detritus. In several of these cases the surface around the well and adjacent tree-trunks is garden ground freely manured with farm-yard refuse.

In passing from Mississippi, where privy vaults have been abolished in favor of the surface system, to Tennessee, where they continue in general use, the character of the well-water supply was found to undergo a marked change. Sewage pollution, which up to this time had been met with only in exceptional cases, was in Brownsville, Tennessee, discovered to be the general condition.

Eleven wells were examined, of which only two were good. Two furnished fair or usable water, one was bad from vegetable impurity, and six were found largely contaminated by sewage from vaults. Incidentally, it was noted by Dr. W. W. Taylor, secretary of the local board, that three cases of typhoid had occurred in a house (that of Judge Bond) supplied by one of these polluted wells.

Only two cisterns were examined, one of which was sound and contained a good water, while the other was leaky—a veritable shallow well—and contained a most impure supply.

In a thriving town like Brownsville, where the soil has become so contaminated as to infect the wells in this manner, it is high time for the establishment of a sewerage system. The vaults should be abolished in the mean time and the Mississippi surface system instituted. But this is beyond the limits of my inquiry, and is mentioned only in passing.

So far as the water supply is concerned, it is is imperative that some action be taken by the local board. The town is ripe for decimation by typhoid fever and other diseases which originate in impurity of soil and are propagated by impure water. The proper remedy is the organization of a water company and the introduction of a supply from a suitable source entirely beyond the risk of pollution by the consumers. But if this requires an expenditure exceeding the means of the town, recourse must be had in the mean time to a rain-water supply, or, in certain locali-

ties outside of the denser areas, to deep wells lined with brick to exclude infiltration from the surface.

The city of Memphis, Tennessee, was found to depend for its supply upon three unequal sources, which, in the order of their importance, were—

First. The underground cisterns, of which it was estimated that there were no less than four thousand in use within the city limits.

Second. The wells, of which there were quite a number, but many of them were not used on account of a bad repute, based principally on the hardness of the water, or the taste of its organic salts.

Third. The hydrant water, or that furnished from the Wolf river by the Memphis Water Company.

Eighty samples of cistern water, from various parts of the city, were examined, with the following result:

	Cisterns.	Water good.	Water fair.	Water bad.	Sewage.
Sound	36	25	8	3	.....
Siping	12	2	1	2	7
Leaky	32	6	2	.....	23
Total	80	33	11	5	31

But these cannot be viewed as illustrating the condition of the four thousand cisterns in the city, inasmuch as, although they came from all quarters, they were in every instance selected samples. Many were brought for examination by citizens whose very anxiety concerning their water supply might be looked upon as an argument in favor of the probability of the cistern being sound and the water pure. Other samples, as those from the public schools, were sent in mainly for the purpose of verifying their purity. On the other hand, samples brought by the medical inspectors for analysis were presented on account of their probable impurity, while the last nine of the waters which were examined were selected by the analyst from a list of those known by preliminary examination to be impure.

But while one may not generalize concerning the Memphis

cisterns from this table, it shows conclusively that the impurity of the soil is such that when a leak exists in the cistern, the probabilities are strongly in favor of a pollution by sewage of the contained water.

As the complete sanitary analysis of a water occupied so much time, and as the number of cisterns was relatively so immense, a ready method was sought by which the condition of a cistern and the probable quality of its contents might be determined.

At first sight, the amount of total solids in a stored rain-water would seem to afford the means of judging as to the soundness of its cistern, any sipage or leakage of necessity carrying into the water earthy and other salts which would increase the total. But several instances occurred in the above analyses where lime carbonate in the residue came manifestly from the cement lining of a sound cistern. This method had therefore to be excluded as fallacious.

No objection, however, attached to an estimation of the chlorine present in the water as an index of the condition of the cistern. Rain-water contains a small proportion of chlorine, the amount varying with the condition of the atmosphere and the purity of the shedding surface. In the inland city of Memphis the amount naturally existing in its rainfall is not large. Rain which was shed from the roof of the Peabody Hotel, during a heavy fall on December 3, contained .075 parts of chlorine in the 100. A cistern water which does not contain more than this must be undeniably free from soil pollution, for the finished analysis showed the soil to be so charged with chlorides that the slightest siping or leakage was marked by an increased chlorine figure. A small excess over the normal might exist and the cistern be sound, the increase being due to an unusual foulness of the roof. As much as .15 parts of chlorine was shown to be consistent with soundness, but as the amount increased beyond this figure the probability of leakage became proportionally great. A series of chlorine determinations was then made on cistern samples collected from all the wards in the city; and, as no selection was exercised, the results may be viewed as expressing the condition of the Memphis cistern supply.

In tabulating them, those waters which contained less than

.075 parts of chlorine are set down as from *undoubtedly sound* cisterns, the supply itself being in all probability of good quality. In cases where the amount lay between .075 and .15 parts the cisterns are recorded as *probably sound*, the increase being due to vegetable contamination and foulness of the shedding surfaces, although in a small proportion of the cases it might be owing to a slight siping from the soil. Here the water must be considered of doubtful quality. In those instances where the chlorine figure lay between .15 and .30 parts, the cistern is reported as probably *siping*, the increase coming from the soil, and being in all likelihood a sewage accompaniment, although in rare cases it might arise from a large organic impurity without leakage on the part of the cistern. In either case the water is probably bad. Lastly, where the amount exceeded .30 parts in the 100 of water, the cistern is viewed as undoubtedly *leaky*, and as containing an impure water supply.

CISTERNS EXAMINED.

Undoubtedly sound	127
Probably sound	82
Probably siping	82
Undoubtedly leaky	158
Total	449

In estimating the condition of the Memphis water supply from this source, there should be added to the above figures nine leaky cisterns, making 167 in a total of 458. These nine samples were brought in for the chlorine experiment along with the others, but a complete sanitary analysis having been subsequently made to determine the characters of their impurity, they were removed from the list of cisterns examined to that of cistern-waters analyzed.

The large proportion of leaky cisterns, with the strong probability of sewage contamination in each instance, requires that some action be taken to insure a better water supply for the city. But whatever may ultimately be done in this direction, the citizens will have to depend upon their cisterns for some time to come. Yet the character of many of these waters is such as to call, in the interest of the public health, for an immediate interference. In several instances I was enabled, by personal com-

munication with the owners, to warn and advise. But in other cases, where the water was brought by the inspecting officers, I did not have the means of notifying the consumers. To overcome this difficulty and enable action to be taken in the cases of certain cisterns, which from their excessive leakage appeared to require immediate attention, I sent a communication embracing some of the facts here recorded to Dr. R. W. Mitchell, member of the National Board of Health, and of the committee on the sanitary survey of Memphis, with a list of sixty-five of the worst cisterns and a map giving the location and character of the whole number examined.

But the facts developed by the analysis constitute only a small part of the total array which demands investigation in the sanitary interests of the city. Among the thirty-five hundred unexamined cisterns there at least twelve hundred which leak. These should be singled out by the local authorities by means of the chlorine test, and their abandonment should be ordered if there is manifest danger from soil pollution in their surroundings; but if there is no such danger it would be sufficient to direct them to be cleaned out and re-lined with a thick coating of Portland cement.

The analyses of the well-waters demonstrated the impurity of the city's soil in as marked a manner as did those of the leaking cisterns. Of nineteen wells, all of which were reported as brick-lined to exclude infiltration, fourteen contained sewage matter, either in the recent state or oxidized by its passage through the soil. Of the five remaining, the use of one was contra-indicated by an excess of earthy salts, so that there were in reality only four waters, out of this list of nineteen, which could be warranted as fit for use. Of those which showed the presence of organic matin an oxidized condition, one—Pontotoc—was so free from recent contamination, and at the same time contained such a small proportion of oxidized matter, that the *water* might be considered as wholesome. The *well*, however, must be looked upon as dangerous, inasmuch as an increased flow of water into it might at any time bring unaltered sewage to pollute the supply.

The waters might be thus classified:

Four good in every respect.

One doubtful, as liable at any time to contamination.

Eight bad in every respect.

Four potable so far as recent organic matter is concerned, but condemned on account of oxidized organic matter and excess of inorganic salts.

One unwholesome solely on account of dissolved inorganic salts.

One potable so far as inorganic constituents are concerned, but condemned on account of organic pollution.

In connection with the cistern and well-water supply of Memphis I have especially to thank Dr. R. W. Mitchell, member of the National Board of Health, and Dr. Frank W. Reilly, superintendent of the house-to-house inspection, for the assistance they furnished, in securing the necessary samples for analysis, and for many valuable suggestions connected with my work.

Besides the cisterns and wells above enumerated, the examinations at Memphis included one water from a tank or reservoir built above ground, one rain-water collected direct from a roof, in order to place on the record the sanitary analysis of the rainfall which was then filling the cisterns, and thirteen samples of river water, one from Elmwood Creek, three from the Mississippi, and nine from the Wolf river.

The supply furnished by the Memphis Water Company is drawn from Wolf river, a short distance above its mouth. It is pumped from the river and distributed without any intermediate process of purification.

During the period of my stay in Memphis, Wolf River was an uninviting stream, turbid with particles of red clay, which, on account of their extreme minuteness, rendered filtration difficult from the tendency of the particles to clog the filter—and sedimentation practically impossible. Entangled with the clay there was much vegetable matter, which could be separated only by the separation of the mineral particles. Hence, analyses of the water made on samples taken on November 12th and 18th and December 2nd and 15th showed it to be unwholesome in a high degree. Many householders who were doubtful as to the condition of their cisterns made use of this water after passing it through a charcoal filter. One such filtered sample was examined and found to be a specimen of very pure water. Those citizens only who made

use of the filtered water had an interest in this result, which is to be set to the credit of the charcoal, not to that of the water. Sedimentation was accomplished on the small scale in a few instances by filling cisterns with the river water at a time when the stream was low and comparatively clear. Three samples of water stored in this manner were examined and found to be of good quality. But the long-continued sedimentation in a clean cistern which is to be credited with this result is a process which, like the charcoal filtration, can be accomplished only in individual cases.

It is, no doubt, true that at other seasons of the year this stream is less impure than at present, but a water, to be suitable for the supply of a large city, should be pure at all seasons, or, if not, it should at least be susceptible of purification on the large scale. The Wolf River water, unfortunately, cannot be thus purified. Any filter which might be constructed would be clogged within a few hours, and a series of reservoirs, to permit of subsidence, would require to be of extravagant size unless some means were devised to hasten the process.

With the view of ascertaining the character of the water higher up the stream than the location of the water-works, a sample was procured on November 18th from Raleigh, a point nine miles distant from the city. This specimen was found to be somewhat less impure than that collected on the same day near the water company's inflow. But it was unwholesome, from an excess of vegetable matter, and as objectionable as the other when viewed as a possible source of supply. It was loaded with the same red clay which renders the hydrant-water so difficult of purification.

In order to effect a comparison between the waters of the Mississippi and Wolf Rivers, Capt. W. H. H. Benyaurd, Corps of Engineers, United States Army, who furnished the samples already mentioned, collected specimens of the Mississippi on November 18th and December 2nd and 15th. But these were insufficient for the purpose. The periods of flood in the two streams are not coincident. On the first of the above dates Wolf River was somewhat swollen, while the rise in the Mississippi had not commenced. The Mississippi water was then a fair sample of river water, containing a certain amount of vegetable impurity, but by no means

so much as has been recorded as existing in some Western streams of good repute as to wholesomeness. On the second date the Mississippi sample, although very turbid, the river being 7½ feet above low water mark, and rising—was comparatively free from organic matter. On the third occasion, the river had risen to 10 feet and was exceedingly turbid. When the Mississippi is at this height, its waters impede the outflow from Wolf River, causing stagnation and flooding in the mouth of the latter. The sample presented the same amount of organic impurity as that furnished by the Wolf River water collected on the same day, enough to condemn it as unfit for potable use.

To establish a comparison between the streams, the annual lines of organic impurity should be determined. But continued observations of this nature do not appear to be called for to decide the question as to which is the better water for a town supply. Both are pure when at low-water mark, and free from impurity. Both are impure when swollen and turbid. So far they agree. But the red clay of the smaller stream rises into turbidity more readily and falls more slowly than the more siliceous sedimentary matters of the Mississippi. This would suggest that the annual period of turbidity and consequent impurity is less in the Mississippi. But the possibility of purifying a supply drawn from it should cause it to be preferred, even if its period of turbidity were greater than that of Wolf River. So far as dissolved inorganic substances are concerned, both waters are of good quality.

This report has, of course, no consideration for the engineering and financial sides of the question.

I have the honor to accompany this report with an itemized list of the various well, spring, river and cistern waters analyzed, and of the Memphis cisterns tested chemically for leakage. I also append a copy of the letter referred to above as having been sent to Dr. R. W. Mitchell with the view of reaching the local authorities of Memphis.

I have the honor to be, very respectfully, your obedient servant,

CHARLES SMART,

Captain and Assistant Surgeon, U. S. A.

Selections.

HOSPITAL PRACTICE.

Hereford General Infirmary.—Case of Hip Disease, with sudden Death from Cardiac Embolism. (*Under the Care of Mr. Turner.*)

For the notes of this interesting case we are indebted to Mr. Charles J. Devis, house-surgeon.

Charles H——, aged fourteen, a farmer's boy, was admitted on Nov. 21st, 1878. His illness began eight months before, when he complained of an aching pain in the right hip. He continued to work, but always with lameness. He grew worse during the two months prior to admission, and was obliged finally to leave off work. On admission he presented the symptoms and signs of synovitis of the right hip-joint—viz., flattening of the buttock, loss of the gluteal fold, flexion of the joint, and great pain on movement of the limb. There were no rigors, and no great variation of the daily temperature. The limb was extended, and Liston's long splint was applied. Iron and cod-liver oil were given internally.

On January 13th there was much tenderness and pain in the region of the hip-joint, aggravated at night, with starting of the limb when going to sleep. There was no fullness in the front of the thigh where the tenderness was greatest.

On Feb. 21st the apparatus was removed. There was much fullness over hip-joint in front of thigh, the fold of the groin being lost. There was no pain on pressing trochanters, and very little on raising the limb. The limb was very stiff at both knee and hip, and there was great œdema of whole limb. The limb was raised on a pillow and enveloped in a flannel bandage. On March

1st he was better, there being very little pain on either pressure or movement. Ordered to sit up a short time each day. On the 3rd he was obliged to return to bed on account of increase of pain and œdema of limb, which latter much resembled that of phlegmasia dolens. Extension was re-applied. On the 5th fluctuation was detected below the great trochanter over an area about two inches by one inch in extent.

On April 12th the pain was less; fluctuation not increased; œdema as great as before. Feet of bed raised on blocks, and the limb well raised on pillows.

On May 15th the œdema of limb was much less, but still persisting; the tissues were brawny and hard; there was no tenderness in the region of the femoral vein or lymphatics; the knee, to which passive motion had been applied, was a little more flexible. An aspirator needle was introduced into the abscess, the contents of which were found to be inspissated pus too thick to pass through the needle.

On June 6th complete anæsthesia was produced by ether given in Clover's inhaler, six drachms being the total quantity used. The knee was fully flexed and the hip partially so, the adhesions readily breaking down. No unusual symptom occurred during the day. Vomiting began half an hour after the operation, and continued until evening (about five hours). The patient slept well and ate his breakfast heartily at 7 o'clock on the following morning. At 8:35 a.m. he told the nurse that he had a pain in his left side, to which she replied that she would give him a fomentation until she could fetch the house-surgeon. Whilst preparing the fomentation the nurse looked up and saw the lad looking very ill, but without any breathlessness, and at once summoned the house-surgeon, who arrived at the bedside within five minutes of the first complaint of pain, only to find him at the last gasp.

Necropsy, forty-eight hours after death.—Hypostatic congestion and rigor mortis well marked; body well nourished; right hip almost completely anchylosed, only admitting of slight flexion; much solid œdema of right lower limb. Thorax: trunk distended with blood; pericardium fully occupied by heart; right auricle much distended, ventricle to a less degree. Lungs pale,

with slight hypostatic congestion. On cutting through the pulmonary artery, it was seen to contain a colorless fibrinous clot of some consistence. Heart: Right auricle full of blood-clot, which extended through the right ventricle into the pulmonary artery to its secondary divisions; centre of clot yellow, firm, and strongly adherent to the auricular appendix; the majority of the clot softer and more friable, partly colorless and partly colored. Left heart empty; ventricle firmly contracted. Abdominal organs healthy, with the exception of a great amount of congestion, most marked in the kidneys. The disease of the hip was found confined to the articulation, the surfaces of the femur and acetabulum both being bare and rough; a large abscess directly communicating with the joint was found deeply situated among the adductor muscles. On examination of the femoral vein, this vessel was found converted into a tough fibrous cord, quite impermeable for an inch and a half in extent, the part of the vein involved being in the apex of Scarpa's triangle. On laying open the vein a firm tough clot closely united to the inner coat of the vessel was found extending upwards for half an inch, and surrounding this was some soft recent clot, which readily broke off. The remainder of the vessel, as well as the external and common iliac, was healthy and permeable.

Remarks.—The question that naturally arises in this case is, how much of the fatal termination was due to the disturbance of the blood-clot in the femoral vein by the manipulation given to the limb? And, depending on that, what was the sequence of events that took place in the vascular system? It would appear that on the flexion of the knee and hip-joints a portion of clot was broken off and carried into the circulation. The lodgment of this embolus in the auricular appendix gave rise to little or no disturbance, but on this was built an immense thrombus, almost filling the auricle, and extending through the ventricle into the pulmonary artery for some distance. Under these circumstances, if such they be, how is such a sudden death to be explained? Not by an extra exertion on the part of the patient, for he was at the time lying quiet in bed, and had not felt any inconvenience when having his breakfast, although occasionally reaching over to his locker.

Ashton-Under-Lyne District Infirmary.—Compound Fracture of Right Superior and Inferior Maxillæ, with Compound Depressed Fracture of Skull and Hernia Cerebri; Recovery. (*Under the Care of Mr. Hopwood.*)

For the notes of this case we are indebted to Mr. S. J. Rennie, the house-surgeon.

W. McC——, aged twenty-eight, bricksetter, was admitted July 30th, 1879, for injuries. He was engaged in removing the center support of the arch of a brick-kiln, and before he could get out of the way the arch fell, and the patient and another man were buried in the ruins. The arch was about nine feet high from the center to the ground.

On admission the patient had a large ragged wound across the right side of his face, from his nose, one nostril of which was torn open, to his ear, passing beneath the margin of the orbit. There was found to be a compound comminuted fracture of the right superior maxilla, which had evidently been caused by a large stone smashing his face. The line of fracture ran through between the central incisors, and the antrum was opened into. The fracture then ran beneath the orbit to the malar bone, which was comminuted, and the zygomatic arch broken. The coronoid process of the lower jaw was broken off, and there was a depressed fracture of the temporal bone just above the zygoma, from which the brain protruded to about the size of a strawberry.

The coronoid process of the lower jaw, and the broken zygoma were removed, the protruding brain matter was shaved off, and the temporal bone, which was slightly driven in, was easily elevated with the tip of the finger. The wound was then washed out with carbolic lotion, several splinters of bone removed, and the parts brought together by sutures, a drainage-tube being introduced. Carbolic lotion as a dressing was applied, a wedge placed between the teeth to elevate the upper jaw, and the whole secured by a four-tailed bandage. Temperature 99° Fahr; pulse 62, full, strong, regular. Ordered six grains of calomel with six of compound ipecacuanha powder. Head to be shaved, and ice-bag applied.

The patient was perfectly sensible when brought in, and thought he was only slightly hurt. There was no shock, nor had

there been any. The pupils were perfectly regular, there was no paralysis of the facial muscles, and the patient expressed himself better as soon as his injuries had been attended to.

Next morning the temperature 98.6°; pulse 62. He felt better. There was some redness about the margin of the wound. Bowels not opened. The calomel and ipecacuanha were repeated; and one-tenth of a grain of tartarized antimony was given every four hours in an effervescing saline mixture; ice to suck; milk and beef-tea. Mouth and nose to be washed out twice daily with Condy's fluid. Evening temperature 99.2°; pulse 64. The bowels were opened once freely. Had one-fourth of a grain of morphia hypodermically.

August 1st.—Morning: Temperature 98.4°; pulse 66. Slept well. Wound looking well. Bowels not opened. Ordered saline aperient mixture. Evening: Temperature 98.2°; pulse 63. Taken milk and beef-tea well. Bowels opened once freely since aperient. Pulse rather irregular and bounding. A quarter of a grain of morphia injected hypodermically.

2nd.—Still feels better. Some redness about neck, but wound looked well. One or two sutures removed. Bowels not opened. Calomel and saline aperient repeated.

3rd.—Morning: Temperature 98.6°; pulse 70, full and compressible. Still improving. Redness about wound less. Wound syringed with Condy's fluid. Bowels opened twice during night. Slept well.

4th.—Better. Wound looking healthy; several sutures removed; dressed as before. Takes milk and beef-tea freely. Tongue clean. Temperature 98.5°; pulse 75. Ordered the calomel and white mixture as before.

6th.—Slept fairly; feels better. Several enlarged glands had made their appearance in his left arm, evidently caused by the irritation of the hypodermic injection; these were painted with iodine.

On the 8th the enlarged glands had disappeared; drainage-tube removed. Wound, from nose half-way, healed, other half granulating, having been kept open by drainage-tube. Tongue clean; bowels regular. Temperature 98.2°; pulse 68. On the 9th he said he felt as well as ever he did in his life. On the 10th the

wound was brought together by strapping. Allowed meat, shredded fine, and oatmeal poridge with milk.

14th. Temperature 97.6°; pulse 76. Still progressing favorably; wound three-quarters healed, rest granulating rapidly.

On the 23rd he was allowed to get out of bed. On the 27th the wound was entirely healed. On Sept. 1st he was convalescent. He had some stiffness on trying to move his lower jaw, and there was some tenderness still during mastication. There is a slight sinking in along the line of fracture, but very little deformity, considering the frightful nature of his injuries.

On Oct. 14th he was seen. He was quite well and working regularly; there was very little disfigurement.

Remarks.—The interesting features of this case are, the enormous amount of injury sustained, with absolutely no symptoms of any moment; and also that it is an illustration of the fact that comparatively large portions of the convolutions of the cerebrum may be removed without any bad results. It shows the value of the careful removal of all, even the minutest, splinters in cases where is a compound comminuted fracture of a thin bone like the wall of the antrum, and the use of frequent syringing of the wound, to remove, as soon as formed, any discharge which might become a source of irritation.

Aberdeen Royal Infirmary.—Case of Naso-Pharyngeal Polypi; Ecrasement and Osteo-Plastic Operation; Rapid Recovery. (*Under the care of Dr. J. C. Ogilvie Will.*)

J. B——, aged seventeen, a fisherman, was admitted on May 4th, 1878, suffering from nasal polypus. The patient stated that about two years and a half ago he fell among rocks, receiving a severe blow upon his nose which caused great hæmorrhage, and was followed by considerable swelling. Six months afterwards he began to experience difficulty in breathing, and suffered from other symptoms of nasal occlusion. The symptoms increasing, and frequent attacks of bleeding supervening, he consulted a medical man, who injected astringent solutions, and extracted a small polypus. Sometime afterwards he was advised to seek admission to the infirmary, and when he did so the following symptoms were noted—namely, nose much deformed, flattened,

and broadened, presenting the appearance of frog-face; right nostril completely blocked up by a tumor which was visible through the anterior nares; the soft palate was depressed and much displaced forward by a hard, firm swelling; deglutition difficult; speech indistinct; breathing during sleep labored and stertorous; sense of smell impaired.

Attempts to determine the points of attachment of the polypi were attended with great difficulty, on account of the lad's nervousness, and after the endeavor which was made to obtain the required information, he made preparations for returning home, and was only prevented from fulfilling his intention by the promise that he should be subjected to no further examination, so that the only information which it was possible to obtain was that the tumor seen through the anterior nares was attached to the floor of the nasal fossa, and the probability of the polypus being a branched one, consisting of two portions springing from a single stem, one passing forward and the other backward, seemed to both Dr. Will and his colleagues to be the most probable state of the parts.

On May 7th the wire rope of an écraseur was passed through the anterior nares into the pharynx, and appeared in the throat, *not* between the tumor and the posterior wall of the pharynx, as it was concluded that it would do from the view that had been taken of the point of attachment of the polypus, but in front of the tumor, or between it and the velum, which indicated that there was opposition to the passage of the wire loop behind, and that the pharyngeal portion of the morbid growth sprang from the base of the skull, and not from the floor of the nasal fossa. This was verified by the next step of the procedure, which consisted in passing the loop attached to the écraseur over the tumor, and then making slight traction on the handle of the instrument, when it was evident that the neck of the tumor was encircled by the wire. The wire was then gradually tightened in the ordinary manner, and in the course of a few moments a polypus the size of a large walnut was removed from the mouth, and the écraseur was then withdrawn. It was now evident that the polypus, which had projected behind and had been removed, was perfectly distinct and separate from the tumour seen through

the anterior nares, for it was still *in situ*. Dr. Will therefore now passed his forefinger into the nostril, and found that it was filled with a large hard tumor, having the attachment to the floor, which he had previously ascertained. He made an endeavor to enucleate it by means of his finger-nail, but the area of attachment was so broad, and the adhesions were so firm, that his efforts were fruitless.

A consultation with Drs. Ogston and Garden was then held, when it was determined to cut through and turn aside the right superior maxillary bone along with the overlying soft parts, in order to gain access to the point of origin of the growth. The bone and soft parts were accordingly detached after the manner of Langenbeck, and free access being thus afforded to the point of attachment of the mass, it was readily extirpated by avulsion and the free use of curved scissors. The bone was then replaced and the soft parts were united by sutures. Hæmorrhage, which was excessive during the operation, was restrained by the application of catgut ligatures to the vessels as they were cut, and by the insertion of a plug of lint into the nostril; no dressings were applied. The polypus thus removed was irregular in shape, somewhat flattened, and about the size of a small tomato. Professor Stirling examined it, and reported that its structure was that of an ordinary œdematous fibrous tumour, with retentive cysts due to obstructed mucous glands. At 4 p. m. the patient was sensible, but exhausted; pulse extremely feeble. No chloroform sickness. Ordered a teaspoonful of brandy every two hours, and ice to suck. 8 p. m.: Had slept a little; did not complain of pain. Pulse stronger, 132; temperature 100.3°. To have an injection of morphia if required.

May 10th.—9 a. m.: Had passed a quiet night without hypodermic injection. No complaint of pain, but stated to nurse that he was already much relieved by the operation, as breathing was so much easier, although the plugs of lint were still in the nostril. Pulse 116; temperature 100°.

11th.—Morning: Passed a somewhat restless night. Parts swollen, and right eye completely closed from œdema. Pulse 113; temperature 101°. Evening: Swelling much lessened.

Union of cut parts complete; all the sutures removed. Pulse 108; temperature 101.1°.

From this date everything went well, the swelling steadily disappearing, the pulse improving in strength and decreasing in frequency, the temperature, which never reached a higher point than 101.2°, speedily becoming normal, and the patient's general condition undergoing so rapid an improvement that on May 18th he was allowed to leave bed, and on the 23rd he was able to go out of doors. For some weeks there was a free discharge of pus from the nostril, which was frequently washed out with an antiseptic solution. One small point in the upper line of incision gave way, and remained open for a considerable period after his return home, but, on the extrusion of a small plate of bone, it speedily healed. On June 8th the lad had left hospital in the enjoyment of perfect health, the wound, with the exception of the small point above mentioned, being soundly healed, while the maxillary bone was firm and immovable.

Six months afterwards, when he presented himself at the hospital, he stated that he could breathe with equal ease through either nostril, and careful examination of the parts previously affected by disease failed to reveal the presence of any morbid appearances, while his face, although disfigured by linear cicatrices, was a not unpleasant looking one, and bore but comparatively slight evidences of the very severe procedure which had been put in force.

DOUBLE MONSTERS. Description of the Specimens in the Museum of the Brooklyn Anatomical and Surgical Society, with Remarks. By LEWIS S. PILCHER, M.D., Demonstrator of Anatomy to the Society; adjunct Professor of Anatomy in the Long Island Hospital Medical College.

The classification adopted in the present paper is that of Fisher. See Articles on Diploteratology, Transactions of the New York State Medical Society, 1865–66–67 and 68.

This classification is itself based upon the one elaborated by Förster (*Die Missbildungen des Menschen*), whose divisions have

been improved and made to follow a more natural order by Fisher.

Double monsters include only beings in which traces of duplicity in the cerebro-spinal axis exist. The method of their development is thus stated by Fisher: "They are invariably the product of a single ovum, with a single vitellus and vitelline membrane, upon which a double cicatricula or two primitive traces are developed. The several forms of double malformation, the degree of duplicity, the character and extent of the fusion, all result from the proximity and relative positions of the neural axes of two more or less complete primitive traces developed on the vitelline membrane of a single ovum."

The clue is thus given to a method of natural classification; the two primitive traces may fuse at their caudal extremity and diverge in varying degrees as they ascend; the result is a double being separated above and joined below, the cleft of the cerebro-spinal axes being from above downward; hence Order I. *Terata katadidyma*, monsters with downward cleavage.

If the fusion is at the cephalic extremity with divergence of the caudal extremities, a double being is produced single above and double below; Order II. *Terata anadidyma*, monsters with upward cleavage.

If the two primitive traces approach at points in their continuity only, while the two extremities diverge, a double being results, double both above and below, with union between; Order III. *Tarata anakatadidyma*, monsters with both upward and downward cleavage.

The differing degrees of duplicity found under each of these orders constitute minor divisions—genera and species—for the nomenclature of which concisely descriptive terms are adopted; the result of this is, that in this classification the name by which any specimen is characterized embodies a fair description of them. I think it merits adoption in preference to any heretofore suggested.

SPECIMEN I. *Order*, Terata katadidyma; *Genus*, diocephalus; *Species*, dibrachius, dipus; *Variety*, diauchenos.

History; mother multiparous; utero-gestation was unattended with anything noteworthy; earlier stages of labor were pro-

longed; a head was finally delivered by forceps, after which no progress was made for some hours. Dr. Andrew Otterson, having then been called, attempted to introduce his hand into the uterus for exploration; partial version of the retained parts resulted from this attempt, so that the breech engaged; efficient contractions followed, producing expulsion of the breech and body, followed lastly by the second head. The child was dead when delivered. The mother recovered without drawback. Specimen presented by Dr. Andrew Otterson.

FIG. 1.—DICEPHALUS DIBRACHIUS. DR. A. OTTERSON'S CASE.

Description.—External Configuration. A fully developed male child. It has two distinct and perfect heads and necks; one trunk; two upper and two lower extremities.

Its extreme length is 48 centimeters (19 inches.)

The girth of the chest, over nipples, is 39 centimeters (15½ inches.)

The two heads differ slightly in their size; the circumference of the left head is 36 centimeters (14¼ inches), that of the right head is 33 centimeters (13⅛ inches).

There is no anal orifice.

The genitals are male, single and perfect.

Skeleton. The vertebral columns are distinct and perfect throughout; they approach each other gradually from above downward as far as to the lumbar region, whence they run parallel to each other, being separated by a small interval; the sacra, each distinct and perfect, articulate with each other by means of an interarticular fibro-cartilage which unites the contiguous auricular surfaces of the two bones.

From each sacrum springs the innominate bone which forms the wall of the pelvis upon that side; at the symphysis pubis the two unite as usual.

The corresponding dorsal vertebræ of the two columns are united by a series of bony arches formed by coalesced ribs; each arch or compound rib has two normal heads, one at either extremity, by which it articulates with its proper vertebra. The length of these arches decreases from above downwards, the longest being 38 millimeters (1½ inches) long.

The ribs, which spring from the free sides of the two vertebral columns, are connected to a common single sternum in front by unusually long costal cartilages, and thus complete the thorax.

The clavicle and scapula of either side are normally related to the sternum and ribs.

Resting upon the posterior face of the upper compound ribs, in the middle of the back between the two series of dorsal spines, is a compound scapula formed by the fusion of two bones along their anterior edges; an acromion process, club-shaped, projects forward from the middle of the upper edge of this compound scapula; articulating with this process, and passing directly forward to articulate with the sternum at its upper border, the episternal notch affording an articulating surface, is a slender compound clavicle.

Respiratory system. Two sets of respiratory organs are present, each independent and perfect. There are four pleural sacs. By the blending of the pleural layers which lie in contact in the middle line, a fibro-serous septum is formed which divides the thorax into two cavities posteriorly; these middle pleural sacs and their contents are hidden from view anteriorly by a large pericardial sac, with the posterior wall of which the anterior margin of the septum described becomes blended.

Circulatory System. The pericardium lies in the middle line, directly behind the sternum, and extends to some distance on each side of it. The sac is single, and incloses a compound heart (Fig. 2), the ventricular portions of which remain separate, while the auricles are blended together. Constituting the left mass of this heart are two ventricles and one auricle, the left, which are of normal size, shape and relative position. The origins and relations of the aorta and pulmonary artery upon this side are normal. Into the auricle enter four pulmonary veins. The elements of the right mass are more changed: there is but one ventricle, which however is larger than either of the ventricles of the other mass; from the right side of its base springs a second aorta; there is no pulmonary artery on this side. There is no apparent attempt at differentiation of the auricles; there is simply a single capacious auricle (d), which is blended with the right auricle from the left mass, forming a huge venous reservoir. At the right posterior side of this reservoir enter two small pulmonary veins from the right pair of lungs.

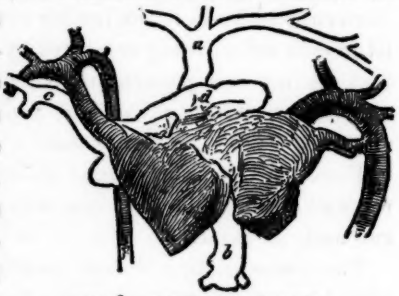

FIG. 2.—COMPOUND HEART.
a. Descending Vena Cava; b. Ascending Vena Cava; c. Right Innominate Vein; d. Compound Auricle.

A single ascending vena cava (b) gathers the blood from the lower portion of the body; above, the left innominate vein of the left child crosses traversely its neck to the point of junction of the two necks, receiving the right internal jugular in its course; here it is joined by the left internal jugular of the right neck,

and by a large anomalous vein from behind; the large descending vena cava (a) thus formed descends in a straight course to the middle of the compound auricle. The right innominate vein (c), formed by the right internal jugular and right subclavian veins of the right neck, empties into the compound auricle at its right side.

The two aortas descend each upon the left side of their proper vertebral columns; they do not unite below, nor bifurcate, but each diverging continues as a common iliac, and after giving off the umbilical artery, passes on to be distributed to a lower limb.

Digestive System. There are two stomachs. The left is of normal shape and size, and occupies its usual place in the abdomen. To its cardiac end is attached a normal spleen, the only one present. The right stomach is smaller, pyriform in shape, hidden behind the liver, lies very obliquely, with its pylorus pointing toward the pylorus of the other. Its duodenum joins at once the left duodenum, and the two bowels appear fused together for one sixth of their entire length; a well-marked longitudinal groove so marks the fused bowel that the appearance of a double-barreled gun is produced; transverse section shows that they are divided by a membranous septum into two distinct canals, which communicate freely with each other by frequent openings in the septum; the bowel then divides into two distinct tubes, each with his own mesentery; this persists through a length equal to one third of the whole; then they again fuse, and the double-barrel arrangement persists through a length somewhat greater than at the beginning; the small intestine finally becomes single, and continues thus to its junction with the large intestine, which likewise remains single to its termination; at the

FIG. 3.—STOMACHS AND COMPOUND DUODENUM.

point of beginning of the single tube a small nipple-like diverticulum exists.

The rectum descends to the bottom of the pelvis, where it ends in a cul-de-sac.

The entire length of the small intestine is 1.84 meters (72½ inches); that of the large intestine 66 centimeters (26 inches).

The liver, upon its surface, appears to be a simple organ, but from its posterior inferior border project supernumerary lobes, the evident remains of a second liver. There is but one gall-bladder.

Genito-urinary system. There are three kidneys—a large compound kidney lying in the mid-lumbar sulcus, and one in either lateral lumbar region.

The left kidney is greatly atrophied; the bladder is single; the genital organs single and well developed.

Nervous system. Each head and neck, and each lateral half of the body is supplied by its own cerebro-spinal axis; along the line of fusion only is there any communication between the branches of the two axes.

Remarks. The genus dicephalus, to which this specimen belongs, is characterized by the existence of two distinct and separate heads, either equal or unequal, with various degrees of duplicity in the vertebral column. The component bodies are laterally conjoined; both of the faces look anteriorly, and usually in the same direction. Fisher states that of five hundred cases of human double monsters which are recorded, almost one-third belong to this genus; in these the female sex preponderates in the proportion of about two to one.

Viability. Apart from the accidents of birth, was this monster viable? The answer to this is found in an examination of the structure of the heart and great vessels. Of the compound heart, the left mass displays all the parts of a complete heart, and the arrangement of the great vessels is normal, so that the æration of the blood and its supply to the left child is fully provided for; the right mass is composed of but one auricle and one ventricle; the venous blood passing from the one to the other would have been at once driven on into the right aorta; no pulmonary artery exists to receive even a portion of it for transmis-

sion to the right pair of lungs, which, for purposes of aeration, would accordingly have been useless. No inosculation between any large arteries of the two systems exists to have permitted any admixture of arterial blood with the venous current of the right system. This condition would have entailed immediate asphyxia upon the right child, had the monster been delivered alive; the speedy death of the left child would have followed; this specimen was not viable.

Closely related to this specimen, but illustrating a degree of fusion less extensive is the living female double monster known as the St. Benoit twins. In this being the division extends through the thorax as far as to the abdomen; so that the thoracic organs and the upper extremities, as well as the necks and heads,

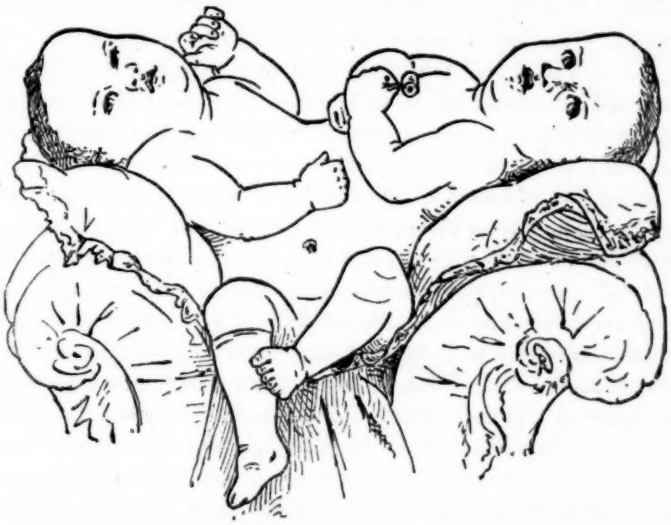

FIG. 4.—ROSE-MARIE DOURIN, "THE SAINT BENOIT TWINS."

are separate and distinct. During the months of December, 1878, and January and February, 1879, this being was exhibited by its parents in this city. Upon the 28th of February it completed its first year. During this time I visited it repeatedly, but met with much difficulty in any attempt at thorough examination of it from the unreasonable fears and prejudices of the parents. I was finally successful, however, in obtaining an inspection of

its whole body, and in enabling Mr. Dickinson to make the sketch which accompanies this report, and which represents well its external configuration.

The names *Marie* and *Rose* have been given to the right and left child respectively. Their patronymic is *Drouin*. In the Canada *Medical and Surgical Journal* of October, 1878, I have since found a description of these beings by Prof. D. C. MacCallum, of Montreal, which, as it corresponds with my own later observation, I repeat:

"Marie is more strongly developed and healthier looking than her sister Rosa, who is smaller, darker and more delicate looking. They are both bright, lively and intelligent looking children. The two bodies, from the heads as far as the abdomen, are well formed, perfectly developed, and in a state of good nutrition. The union between them commences at the lower part of the thorax of each, and from that part downwards they present the appearance of one female child; that is, there is but one abdomen with one navel, a genital fissure with the external organs of generation of the female, and two inferior extremities. The floating ribs are distinct in each, as is also the ensiform cartilage. The lateral halves of the abdomen and the inferior extremities correspond in size and development respectively to the body of the same side; and the same remark applies to the labia majora. The spinal columns are distinct and appear to meet at a pelvis common to both, although the fusion of the children commences at some distance above their junction. From near the extremity of each spine a fissure extends downwards and inwards, meeting its fellow of the opposite side at the cleft between the buttocks near the anus, including a somewhat elevated soft fleshy mass, thicker below than above. At a central point between these fissures, at the distance of two and a half inches [64 mm.] from the point where the vertebral columns meet, and three and a half inches [89 mm.] from the anus, there projects a rudimentary limb with a very movable attachment. This limb, which measures five inches [127 mm.] in length, and is provided with a joint, tapers to a fine point, which is furnished with a distinct nail. It is very sensitive, and contracts strongly when slightly irritated.

"The spinal, respiratory, circulatory and digestive systems of these children are quite distinct. They have each a separate diaphragm, and the abdominal muscles on each side of the mesial line, and the limbs of that side are supplied with blood by the vessels, and are under the control of the nervous system of the corresponding child. They have each a distinct stomach and an alimentary canal, which probably opens at a point close to the common anus. It would follow also that the accessory organs of the digestive system are distinct for each child.

"The two fissures behind are evidently the original clefts between the buttocks of each child, one buttock remaining in its integrity, whilst the other in a rudimentary condition is fused with that of the opposite child, forming the soft fleshy mass from the upper part of which the rudimentary limb projects.

"These children are the products of a second gestation. They were born at St. Benoit, county of Two Mountains, on the 28th February, 1878. The mother is a fine, healthy-looking woman, aged 26 years. Her labor lasted seven hours, commencing at 1 A. M. and terminating at 8 A. M. One head and body were first born; this was shortly followed by the lower extremities, and immediately after the second body and head were expelled."

This being belongs to the genus dicephalus; species tetrabrachius tripus.

The St. Benoit twins have now survived their birth a longer period than in any other recorded instance among the three-footed, four-armed dicephalic monsters. The case recorded by MacLaurin, in the Philosophical Transactions, London, 1723, Vol. XXXII. page 346, which lived for two months, is the next longest lived recorded.

When last examined by myself, this being had attained thirteen months of age; its vital functions were all being performed regularly and properly, and the mental development of the two parts was equal to that usual to children of its age. It apparently had as good an expectation of living to maturity as any other infant.

This being, though strictly included in the species to which I have assigned it, still, in consequence of the very rudimentary character of the third pelvic limb, approaches very closely to the

species dicephalus tetrabrachius dipus, which it resembles in its high degree of viability. This rudimentary limb had not grown correspondingly with the rest of the body, and when seen by myself was but little longer than it is described to have been by Dr. MacCallum, ten months before. To this latter species belongs the widely-known case, Ritta-Christina, which died at Paris, November 23d, 1829, having lived eight months and eleven days.

FIG. 5.—RITTA-CHRISTINA.

SPECIMEN II. *Order*, Terata Katadidyma; *Genus*, dicephalus; *Species*, dibrachius; *Variety*, monauchenos.

History: This specimen of two-headed, single-necked monster, with one body and two anterior extremities, is a lamb which was born in the spring of 1874, near Plainfield, N. J. Having been at once discarded by its mother, it was spoon-fed for a time; it received nourishment by one mouth only, some imperfection seeming to exist in the other. It lived between two and three weeks. It was then prepared by a taxidermist, and no record made of its internal structure. It was afterwards secured by Dr. A. R. Matheson, by whom it has been presented to the museum of the society.

FIG. 6.—TWO-HEADED LAMB.

Description: The heads are equal and perfect, as far as external examination shows; they form an obtuse angle with each other as they spring from the single neck; the neck externally shows no evidence of duplicity, although undoubtedly there did exist some duplicity in the upper cervical vertebræ. It is to be regretted that the arrangements of the tracheæ and œsophagi cannot be ascertained.

According to Fisher, this an extremely rare variety of duplex formation, so much so that only two or three examples of it have ever been recorded.

SPECIMEN III. *Order*, Terata Katadidyma; *Genus*, diprosopus; *Variety*, triophthalmus.

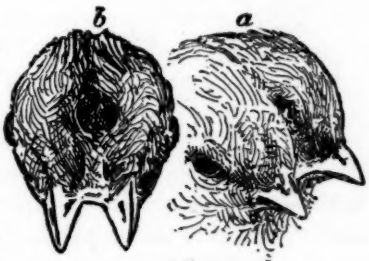

FIG. 7. DONBLE-FACED CHICK.
a. side view. b. front view of same.

This specimen of double-faced, three-eyed monster, is a small chick, the history of which is unknown. It was presented to the museum by Mr. James E. Pilcher. The accompanying figures admirably exhibit the degree of duplicity present. The angle made by the converging facial planes is very acute, so that the two bills are nearly parallel, and but little separated from each other. The median eye, its palpebæ being single, presents two globes within its orbit, which are fused together.

These three museum specimens, together with the Saint Benoit twins, illustrate well a gradually descending scale of duplicity resulting from a less and less degree of divergence of the cephalic extremities of two primitive traces. They are all well-marked examples of monsters duplex with downward cleavage. The order of monsters duplex with upward cleavage is equally well represented in the two remaining specimens in which the vertebral axes, independent and divergent at their caudal ends, gradually approach until finally they become fused at their cephalic ends.

SPECIMENS IV. and V. *Order*, Terata Anadidyma; *Genus*, syncephalus; *Species*, monoprosopus.

FIG. 8.—SKELETON OF SYNCEPHALIC DOG.

These two specimems of double-bodied, single-headed, single-faced monsters are identical with each other in their general character. Specimen IV. (Fig. 8.) consists of the skeleton of a duplex puppy which did not survive its birth. It was presented by Dr. J. H. Raymond, and prepared by the writer. The sex was female. There was a common umbilical cord, containing a single umbilical vein; the liver was compound; the stomach and upper two-thirds of the small intestine were single, the intestinal canal then bifurcated and was double to it send; the genito-urinary systems were independent and complete for each body; the thorax contained two perfect sets of lungs; the hearts were fused.

Specimen V. (Fig. 9.) is a duplex chick which was presented by Dr. George W. Baker. Its viscera have not been examined. In these specimens, the head presents no external trace of duplicity; the spinal axes of the compound body, closely juxtaposed at their cephalic extremities, rapidly diverge, and from each of them is developed a complete bony skeleton; these blend so as to form a compound thorax as follows: each lateral half of the sternum with its proper ribs is reflected outward to the right and to the left, and becomes conjoined to the corresponding half sternum of the opposite skeleton. The thoracic cavity thus resulting has a sternum

FIG. 9. SYNCEPHALIC CHICK.

anteriorly, and posteriorly a vertebral column at either side, and walls composed of forty-eight ribs. Four complete anterior extremities spring from this thorax. Each pelvis is separate and distinct, and has its perfectly developed limbs. In the case of the pup the fusion extended as far as to the umbilicus. In the case of the chick the fused abdomens form a demi-ovoid body suspended between the four feet of the animal. It did not survive its birth. According to Is. G. Saint Hilaire (1832) this class of monstrosities is comparatively common among animals, but very rare in man, to but two cases of which is he able to refer. Fisher's treatise is still incomplete: the published part of it does not include the syncephali, but in his manuscript, which I have been permitted to examine, I find mention of eight recorded instances of human syncephali.

HYDROBROMIC ETHER AS AN ANÆSTHETIC.—The experiments of Rabuteau on the lower animals to demonstrate the anæsthetic properties of hydrobromic ether have, says the *Boston Medical and Surgical Journal*, led Dr. Turnbull of Philadelphia to employ it on the human subject. His successful results have induced others to make use of the substance, and Dr. Lewis has used it for large operations at the Pennsylvania Hospital with gratifying success. Four cases are recorded, viz., amputation of the forearm at the upper third; perineal section for stricture of urethra; resection of stump after former amputation of the arm; and in a case of fracture of both legs, where it was administered in order that a careful examination might be made and tenotomy be performed. The after-effects of the inhalation are less severe than those following the use of chloroform, and the return to consciousness very much more rapid. Though its claims to be admitted into general use are said to be strong, it is admitted that it needs more careful observation to establish it firmly as a safe anæsthetic in general surgery.—*Medical Press and Circular* 14th January, 1880.

Summary.

Collaborators:

DR. L. W. CASE, DR. R. TILLEY.

PRACTICAL MEDICINE.

ON ALCOHOLIC VASCULAR TENSION AND ITS EFFECTS.—(By John C. Thorowgood, M.D., F.R.C.P.)—*Medical Press and Circular*, 21st January, 1880.

Persistent excess in the use of alcohol by a healthy person maintains a condition of extra pressure and strain on the small vessels, which at last finds relief in hæmorrhage. If the patient be somewhat on in years, and have weak degenerative vessels, then a condition of tightness and over-pressure is most dangerous. How often do we have to see a robust-looking man suddenly struck down by cerebral hæmorrhage? Probably he has had a good dinner and drunk liberally, and when the doctor arrives and finds the poor man senseless on the sofa, every one says that he had been congratulated only the day before, and told how well he was looking. Supposing the vascular tension induced by a too free use of alcohol does not at once issue in a bleeding, it appears to maintain a constant strain on the heart and vessels, which seriously impairs the nutrition of the structure, so that the weak and wasted coats of the blood-vessels become very prone to laceration and rupture—a condition well expressed by the popular term, "rotten from drink." Thus cirrhosis of the liver and granular disease of the kidney may be set going. The variability in the degree of blood-pressure, according as the patient is or

is not under alcoholic influence, produces a singular irritability of the nervous system. Sleepless nights with palpitating heart, morning retching and coughing, and utter want of appetite for breakfast, are among a few of these effects. Want of decision on momentous points, impatience and recklessness, tinglings, numbness, and shooting pains, are other signs of disturbed innervation. The sudden withdrawal of all stimulus from those persons who have been living in a perpetual state of excessive tension and strain is followed by more or less collapse and sense of exhaustion and sinking, driving a few weak ones back to the drink as being their only safeguard from doing something dreadful. The best advice to give during this very painful and trying crisis is to encourage the patient to outlive it, by assuring him that it is but temporary, and to take care that he is well supplied with the best of nourishment, and with good fresh coffee when he feels especially down and low, while at the same time he takes a bitter tonic medicine; and, under this regimen and a fair amount of resolution on his own part, there comes in time a renewal of life and a restoration of nerve that is most satisfactory to witness.

CASE OF PRECOCIOUS HYSTERIA.—M. Ad. Henrot. (*Union Méd. du Nord-Est.*, Dec., 1879, p. 363.)

The author reports the case of a young girl, aged 12 years, who suddenly, without any known reason, had convulsive attacks, with suffocation, cough, barking and esophageal spasms.

The attacks were very frequent, and had existed twelve days when the author saw the case for the first time. Her physiognomy was excellent, and nothing in her general condition would give rise to a suspicion of so profound a disturbance of the nervous system. The entire series of antispasmodic medicines had been employed without any result. M. Henrot thought it advisable to make use of a tolerably energetic means which had proved of value in analogous cases. At the first nervous attack which the young hysteric had in his presence, he flagellated her unmercifully with a napkin dipped in cold water. The attack ceased at once. Since that, the nervous troubles have completely disappeared.

SURGERY.

PARAPHIMOSIS—SIMPLE MODE OF REDUCTION.—(*Le Praticien*, No. 1, 1880.)

In very difficult cases, where ordinary means fail, Bardinet proceeds as follows: he takes a hair-pin, presses the points together somewhat, and inserts the curved end under the strangulation back of the gland. He then applies a second and a third at intervals around the gland; then, drawing the prepuce forwards, reduces it with great facility, the skin sliding over the three bridges without obstruction.

ERECTILE TUMOR TREATED BY INJECTION OF CHLORAL.—Dr. Antonio Pupi. (*Le Sperimentale* and *Le Praticien*, No. 62, 1879.)

A rapidly growing erectile tumor of the naso-palpebral region was injected at intervals of fifteen days with an aqueous solution of chloral, 1 to 10. After each injection, the consecutive tumefaction was almost immediate, but not painful, and only lasted four or five days. The cure was as complete as possible, scarcely any traces of the tumor being visible.

SPERMATIC COLIC.—M. Reliquet. (*Journ. de Méd.*, Dec., 1879, p. 552.)

The author reports the case of a man fifty years of age, in whom a diagnosis of tubercles of the prostate was made, and who presented the following symptoms; at first, sharp pains during coitus; painful excitation of the perineum, with frequent desire to urinate when riding in vehicles; on several occasions, brusque emission of a liquid analogous to the semen. The frequent desire to urinate became insupportable.

Rectal examination revealed a prostate with unequal lobes, the right presenting a well-defined protuberance prolonged backward, and continuous with the seminal vesicle. Pressure with the finger but slightly painful, but caused a desire to urinate. On introducing an elastic bougie, and pressing the tumor between the sound and the finger, a greyish mass escaped, resembling vermi-

celli, and the tumor diminished. Examination showed this to be composed of altered spermatozoa and mucus.

The spermatic colic, the retention of the semen in an altered ejaculatory canal, caused all the accidents. After repeated soundings, and further evacuations of this matter, the tumor disappeared. At the same time, the reflex trouble of micturition disappeared; even the bladder had been imperfectly emptied.

M. Reliquet has already noticed an analogous case, where the evacuation was caused by the presence of a lithoclast in the urethra.

He thinks, moreover, that real spermatic colic, less severe, exists especially in continent persons, which coitus relieves for a few days. The curative indications are very clear. One must understand this repletion to explain certain troubles of micturition, which otherwise remain inexplicable.

THERAPEUTICS.

UNALTERABLE COLD-CREAM.—The *Repertoire de Pharmacie* gives the following formula for a cold-cream that possesses the property of not becoming rancid:

Quince mucilage.....(ℨijss)	40	grams.
Almond soap.....(gr. xv)	1	"
Stearic acid.....(ℨijss)	10	"
Glycerine .....(ℨss)	2	"

EXTERNAL USE OF ATROPINE FOR THE PAIN OF CANCERS.—(*Gaz. Obstet.*, Jan. 20, 1880.)

M. Anger uses, with great success, compresses saturated with a neutral solution of sulphate of atropia, and applied over the seat of pain. The compress is covered with oiled taffeta, or better with sheets of gutta percha, to prevent evaporation, and renewed three or four times a day.

The strength of the solution employed is (grs. xv) 1 gram of the sulphate to (Oij) 1,000 grams of water. He has never seen signs of absorption of the medicine, such as dilatation of the pupil, dryness of the throat, etc. This action is not denied, but it is pre-

sumable that the action is local, contraction of the vessels, diminution of the sensibility. The facility of applying it, and the cleanness of this method, give marked advantages over hypodermic injections and ointments. At the same time, the marked relief observed in the terrible pains of cancer seem to recommend its use.

TREATMENT OF SCARLET FEVER.—Archambault. (*Le Praticien*, No. 2, 1880.)

Hygienic.—An airy room, no more than the ordinary covering; keep the patient in bed as long as possible, even though the malady seems to have terminated about the seventh or eighth day, when desquamation begins; precautions against taking cold for three or four weeks, for nephritis, which commences from the twelfth to the twenty-third day, rarely comes on after the fourth week. Cover the articulations well, as they are frequently subject to rheumatism or arthritis. The patient should not go out before the sixth week. Baths after the third week. To allay itching, cold-cream and glycerine, or simple dusting with starch powder. Restricted diet at first; more nutritive diet after the fever recedes.

Medical Treatment.—If the eruption is long in appearing, borage tea and a potion of (℥ss) 2 grams of acetate of ammonia in (℥iv) 125 grams of mucilaginous mixture. Correct constipation with castor oil or rhubarb. When the eruption is free, give emollient or cooling drinks. If delirium comes on, give bromide of potassium.

Bromide of potassium.....	(℥ss–j)	2 to 4 grams.
Syrup of cherry laurel.....	(℥ss)	20 grams.
Syrup diacoccymelon.....	(℥ijss)	10 "
Hydralate of tilia.....	(℥iij)	100 "

of which the child takes a tablespoonful hourly.

Treatment of the Angina.—Chlorate of potassium as a gargle, or in younger children in the form of pastilles or mixed with sugar. Caustics are useless. The physician should exercise a rigorous surveillance, even in the simplest cases in appearance, as they may be followed by nephritis, endocarditis, or articular rheumatism.

Items.

COMMENCEMENT EXERCISES OF RUSH MEDICAL COLLEGE.

The thirty-seventh annual commencement exercises of Rush Medical College were held on Tuesday, February 24th, 1880, at 2:30 P. M., at the Third Presbyterian Church, corner of Ogden and Ashland avenues.

The following was the order of exercises:

1, Music; 2, Prayer; 3, Music; 4, Secretary's Report of the College Year; 5, Conferring of Degrees; 6, Music; 7, Charge of Acting-President Miller; 8, Response, on behalf of the class, by Dr. C. H. Lewis; 9, Music; 10. Valedictory Address, by Prof. Henry M. Lyman; 11, Music; 12, Benediction; 13, Music.

Following is the list of the Graduating Class of 1880:

Officers of the Class.—T. W. Brophy, President; S. S. McArthur, Vice-President; J. R. Robinson, Secretary; C. H. Lewis, Valedictorian.

Executive Committee.—E. H. Disbrow, S. C. Waters, H. Pritchard, E. S. Talbot, R. C. Meacher.

Johnson Armstrong, George Frank Allen, Winfield Ackley, M. D., Truman William Brophy, D. D. S., Samuel Cleland Bowman, John Anthony Badgley, Luther George Bass, B. A., Raymond Willis Battles, Franklin Albert Butterfield, George Frederick Bradley, Frank Preston Brown, Ignatius Bronish, Robert Leonard Boon, Fernando Wood Burdick, Marion Cazier, Willis Clay, David Gray Campbell, Charles Henry Carter, James Sylvester Collins, George Thomas Carpenter, D. D. S., John Francis Cully, Patrick William Conway, James Coolidge, John Franklin Cameron, Charles William Cruter, B. S., Francis Conrath, PH. G., James William Campbell, John Douglass Camerer, John Cicero Capps, James Calvin Clark, William George Dwyer, Joseph F.

Dicus, Ernest David Disbrow, Herbert William Davis, Calvin Todd Dripps, A. M., William Henry Earles, William Harter Everhard, Aaron Welch Edmiston, Henry Alonzo Ediston, William Henry Ellis, Hurford Edmur Farley, Francis William Fitzgerald, PH. G., Edward Fischer, A. B , Albert Lawrence Farr, George Henry Grose, John Colton Goodspeed, Charles Wesley Gordon, M. D., Joseph Godfrey, Myron Page Goodwin, William Greig, William Frank Graham, B. S., Levi Atchley Golden, William T. Green, William Elvis Harwood, William Arthur Hawley, Mortimer Lambert Hildreth, Herbert Dainy Hill, William Franklin Howe, Warner Holt, M. L., Samuel Ferdinand Hammond, Isaac William Hanna, Alvin Coles Hiester, William Clark Hill, Furman Springer Hand, Joseph Haven, J. Nathaniel Henry Huggins, John Alexander Inks, William Johnson, Claes William Johnson, Frank Joseph Jirka, Addison Coffea James, George Edwin Jackson, George Kernahan, Joshua Moffitt Kidney, Herbert Kendall, William Henry Lewis, William Bardwell Lyman, John Van Reed Lyman, Seth Ward Lacy, William Albert Lisman, Clinton Huntington Lewis, B. S., Peter Thames Mogstad, A. M., Nathaniel Massie McKitterick, George Bessore McCosh, Walter Scott Mason, Michael H. McGrath, Melvin Lazelle Moore, Julian Edwin Murray, Robert Edward Miller, John Hale Mannon, A. M., French Moore, Byron Coleman Meacher, Ezekial P. Murdock, A. M., Lucien Edward Murray, Willis Fremont Moore, Lewis Linn McArthur, John Leonard Mulfinger, PH. G., Marshall Thomas Martin, Joseph Converse McCormick, M. D., John Crittenden Nichols, John William Neill, Charles Frederick Nitz, Adamson Bentley Newkirk, Nelson Eugene Oliver, Daniel Samuel O'Brien, Harry Pritchard, Charles Nelson Palmer, Charles David Parks, Albert David Pyke, Francis Isaac Pinch, Eugene Beauharnoise Perry, James Franklin Paul. M. D., Will Aerious Quigley, John Hiram Quinn, Herman Reineking, George Jacob Rubleman, Monroe Griffith Reynolds, John A. Robinson, A. B., Emery Waland Roe, John Ritter, Charles Lester Stadler, Frank Buchanan Smith, Philip D. Shunk, Allen Vinton Smith, John Fritz Herbert Sugg, George Cassius Synon, B. S., E. Hudson Sammons, Thomas Jefferson Shaw, George Charles Somers, Walter Henderson Scott, Eugene

Colvin Southard, Albert John Scholl, Eugene Solomon Talbot, D. D. S., George Lytle Turner, William Wilson Torrence, Ely Judson Tanner, Milton Van Dyke, Walter Nathaniel Vilas, Charles Douglass Wright, Albert John Woodcock, Henry V. Worley, Peter N. Woods, M. D., Lisle Cummins Waters, Harmon Jackson Wall.

ALUMNI ASSOCIATION OF RUSH MEDICAL COLLEGE. GRAND PACIFIC HOTEL, FEBRUARY 24, 1880.

The Alumni Association of Rush Medical College was called to order at 8 p. m. by the President, Dr. Robert M. McArthur, of Ottawa, Ill. A large number of the old Alumni and the recent graduates were present.

The secretary's minutes of the last meeting were read and approved, and the resolutions offered by Dr. Ingals at the last annual meeting, regarding the course of training in the college, were adopted by the association.

"The Alumni of Rush Medical College desire to express, in a formal and public manner, the affectionate regard we entertain for our Alma Mater, our pride in her past history, and our confident hopes for her increased usefulness in the future. We hold that her supreme duty to the public, which has always accorded her a generous support, demands that her first aim and object should be to aid in exalting the attainments of the medical profession, and by so doing to increase its usefulness, power and respectability. As a mode of accomplishing these results we would respectfully offer to the board of trustees of the college the following suggestions:

"*First.* To increase the regular annual term of college instruction to a period of not less than nine months.

"*Second.* To require attendance on three full terms of medical lectures as a pre-requisite to admission to examination for the degree of Doctor of Medicine.

"*Third.* To institute preliminary examinations for students who apply for matriculation to the school, and admit only such as have at least a thorough English education."

The treasurer's report was next read and approved. The executive committee then presented the list of names nominated for

officers of the association for the ensuing year. The officers were elected *viva voce*, the nominations of the committee being unanimously concurred in. The officers elected were as follows: President, Solon Marks, Milwaukee, Wis.; 1st Vice President, W. C. Hunt, Chicago; 2d Vice President, S. T. Ferguson, Minooka, Ill.; Secretary and Treasurer, E. Fletcher Ingals, Chicago; Executive Committee, James Nevins Hyde, T. Davis Fitch and F. Henrotin, Chicago.

The president's address was next in order. It will be found in the printed transactions. After the reading of the president's address the association adjourned to the upper rooms, where some time was spent in social converse before the guests were invited to the banquet hall. The Alumni were called by classes and were so seated that acquaintances were placed at the same table, an arrangement which greatly added to the pleasure of the evening.

The after-dinner speeches were as follows: Toasts—1. "The graduates of long ago," which was responded to by Dr. Solon Marks, of Milwaukee. 2. "Our visiting Alumni," responded to by Dr. Wm. Meachum, of Racine. 3. "The Spring Faculty," responded to by Dr. J. Suydam Knox, of Chicago. 4. "Clinical Instruction," responded to by Dr. S. D. Jacobson, of the Cook County Hospital. 5. "The best class graduated," responded to by Dr. C. T. Dripps. 6. "The Profession of Medicine," responded to by the well-known humorist Dr. Charles Gilman Smith. 7. The seventh toast, "Old Rush," was responded to by Prof. Delaskie Miller, who compared the growth of the college to that of our honored guest (Gov. Cullom), the chief executive of our State. He pointed out the steady and efficient growth which had taken place in the processes of medical education, and called attention to the vastly increased facilities which were now offered for thorough training in the healing art.

The master of ceremonies then called upon Dr. P. W. Brophy, a well-known dentist of this city, who, together with his fellows, Drs. Talbot and Carpenter, had that day, after great sacrifices for the last three years, added to their titles of D. D. S. that of Doctor of Medicine.

Dr. Brophy related the history of dentistry, and stated his firm conviction that dentistry must become one of the specialties

of medicine before it could properly be called a profession. He believed that ere long it would be considered necessary for every dentist to have a thorough medical training before he was fitted for that branch of the profession.

The association then adjourned to meet on commencement day at the close of the next session.

A letter was then read from Prof. H. A. Johnson, of the Chicago Medical College, an alumnus of Rush College, Class of '52. Dr. Johnson had consented to reply to the sentiment in the 6th toast, but at the time of the gathering he was confined to his room by sickness. His letter was received with applause which was only limited by our regret that its author could not be present.

Many letters of regret had been received by the Secretary from the Alumni in distant parts of the country, but owing to the lateness of the hour only one of them could be read. At the request of the toast-master the secretary read the letter of Dr. Arthur Young, of Prescott, Wisconsin, class of 1853.

Dr. Young was one of those who knew the worth of a thorough medical education, and who had himself taken the full course of lectures before entering upon *his* professional career. He wrote feelingly of the departed ones who had lectured to the classes of his college days, and to many of his own classmates who "rested from their labors." With pride he pointed to the past and with firm hope to the future of Alma Mater.

THE CHICAGO MEDICAL COLLEGE.

The twenty-first commencement of the Chicago Medical College, Medical Department Northwestern University, occurred on March 30th in Plymouth Congregational church. A large audience was present, including members of the college with their friends. The music was furnished by a section of the Chicago orchestra. The exercises passed off pleasantly, many floral tributes being presented to the members of the graduating class.

The Rev. C. H. Everest offered the opening prayer. This was followed by the awarding of prizes. The standard prizes for the best graduating theses were awarded to F. H. Kimball and J. E. Bumstead. The prize offered by Dr. C. W. Earle, Dr. Smith's

work on diseases of children, was awarded to N. E. Oliver for the highest proficiency in that department. A valuable work on surgery by S. D. Gross, offered by Dr. N. Senn, of Milwaukee, for the best anatomical preparation, was awarded to T. N. Miller. Prizes for the best work in anatomy were awarded to J. J. Fordyce and Frank Billings, in virtue of which they will be assistant acting demonstrators of anatomy. E. Andrews, Frank Johnson, and W. S. Gates also received honorable mention and will act as alternates to the above. Prof. R. L. Rea, the professor of anatomy, awarded to Frank Billings and A. M. Vail, a prize each for the best work in his department. The prize was a gold medal engraved with the letter "A" and a $10 gold piece. The prize for the best chemical work was awarded to Frank Billings, and for best labratory work by members of the junior class to E. L. Hollister; for best lecture notes to J. E. Marshall. These prizes consisted of standard works on medical chemistry.

Diplomas were then conferred to

THE GRADUATING CLASS

as follows:

Hiram H. Baldwin, James E. Bumstead, James Carter, J. Madison G. Carter, Andrew J. Coey, Charles E. Cook, John C. Cook, George R. Colby, William Dodd, A. A. Eddy, Wyman H. Fisher, William E. Gallup, Edgar A. Holmes, John I. Hostetter, Fred. O. Hoyt, Levi H. Johnson, Charles L. King, Frank H. Kimball, James J. Larkin, Frank H. Martin, Thomas N. Miller, George W. Mason, Nathaniel E. Oliver, Fred J. Parkhurst, Ernest Pierpoint, Lorenzo T. Potter, R. W. Emerson Puckett, John N. Pascoe, Fred. D. Rodgers, George U. Runcie, Willis S. Reynolds, Hein Terhorst, Homer H. Throop, Newton M. Wade, Thomas A. Ward, Milton P. White.

The ad eundem degree to graduates of other colleges was given to Benjamin F. Black and W. Frank Hicks. The appointments to the house staff of Mercy Hospital for the ensuing year were made to James J. Larkin, Frank H. Martin, and L. T. Potter, all of them being members of the graduating class. These degrees and appointments were accompanied by a few appropriate words by Prof. N. S. Davis.

A feeling response on behalf of the class was made by George W. Mason, and the valedictory address on behalf of the faculty by Prof. E. W. Jenks.

At the close of the exercises it was announced that the practitioners' course of study to last four weeks would commence at once.

A BUSINESS MEETING.

In the evening the annual business and fourteenth reunion of the Alumni Association was held at the Tremont House. The business meeting was presided over by Dr. Norman Bridge, first vice-president, who, on assuming the chair, referred in a few appropriate words to the death of Dr. John M. Woodworth, president of the association.

During the absence of the committee appointed to nominate officers for the ensuing year, the necrologist's report was read, and showed a record of four deaths in the roll of membership during the past year. These were Dr. D. H. Alvis, class of '70, Kewaunee, Ill.; Dr. Zenophan Chapman, class of '74, Leadville; Dr. F. A. Beck, class of '77, Chicago, and Dr. G. H. A. Sienank, class of '77, Silver Lake, Kan. On the the close of the reading of the necrologist's report, Dr. Norman Bridge again referred to the death of President Woodworth, paying an eloquent tribute to the memory of the deceased gentleman. Other members of the association also referred to the deceased president and members.

The nominating committee then reported the following list of officers, which was unanimously adopted:

Dr. W. E. Quine, president, Chicago; Dr. Webber, first vice president, Detroit; Dr. Fitch, second vice-president, Rockford; Dr. D. A. K. Steele, secretary and treasurer, Chicago; Dr. Waxham, necrologist, Chicago.

Dr. Steele, who has served as secretary and treasurer of the association for over five years, gave notice of his intended resignation at the next annual reunion.

THE BANQUET.

This closed the business meeting and the members of the association to the number of one hundred, accompanied by a dozen or

so members of the present year's graduating class, repaired to the ladies' ordinary, where the social exercises of the evening were indulged in. Dr. Quine, the newly-elected president, occupied the seat of honor, upon assuming which he fittingly thanked the association for the honors conferred upon him.

The programme had assigned Dr. Lyman Ware to deliver the address of welcome, but owing to the absence of that gentleman the banquet was proceeded with in an informal way. At its close toasts and responses followed in rapid succession. "The Old Folks" was responded to by Prof. R. L. Rea, of this city; "Big Brothers," by Dr. Webber, of Detroit; "The Baby," by Dr. F. H. Kimball, of Chicago, and "First Cousins," by Hon. J. S. Grinnell, of Iowa. A number of impromptu toasts were given and responded to by Drs. Hosmer A. Johnson, Rev. Dr. Edwards and others, the gathering indulging in the pleasures of the occasion until a late hour.

WOMAN'S MEDICAL COLLEGE OF CHICAGO.

THE tenth annual commencement of the Woman's Medical College of Chicago was held at the Union Park Congregational Church, March 2d, 1880.

Prof. Wm. H. Byford, president, conferred the degree upon Addie Akins, Jennie M. Dobson, A. M. Davenport, Jennie E. Hayner, Elizabeth McKittrick, Emma M. Nichols, Julia M. Patten, Amelia Augur Platt, Mary Lyman Rockwell and Eugenia A. Watts.

A special certificate was given Mrs. M. L. Rockwell, Mrs. Amelia A. Platt and Mis A. M. Davenport for general proficiency and for attendance upon three full courses of lectures.

Prizes for special merit, as evinced on examinations, were awarded to Miss Jennie E. Hayner and Miss A. M. Davenport.

The class valedictory was delivered by Miss Julia M. Patten.

The faculty address by Prof. I. N. Danforth.

An elegant entertainment was given by Prof. C. W. Earle, at his residence, at the close of the exercises, to the graduating class, the alumni of the college and their friends.

Miss Emma M. Nichols, M.D., has been appointed House Physician at the Woman's Hospital of the State of Illinois, and Miss

Jennie E. Hayner, M.D., Resident Physician at the Chicago Hospital for Women and Children. The appointments were made after a competitive examination.

MEDICAL DEPARTMENT, IOWA STATE UNIVERSITY.

The commencement of the Medical Department of the Iowa State University was held in the opera house at Iowa City, on Wednesday evening March 3d.

President Pickard conferred the degree of M.D. upon the following ladies and gentlemen:

Miss H. A. Conniff, Miss Olive Morris, L. H. Munn, W. J. Saunders, T. J. Shuell, R. J. C. Dodds, A. C. Jennis, G. M. Barber, John Riley, P. O'Hair, J. C. Davies, F. S. Johnson, W. K. Williams, H. Parrish, C. E. Nichols, W. E. Edgerton, J. C. Wright, John R. Coxe, C. P. Dolan, T. J. Williams, A. D. Paine, L. L. Renshaw.

This class had been examined for two days by a board of examiners, members of the Iowa State Medical Society, consisting of Dr. Fitch, Charles City, chairman; Dr. Clark, Grinnell; Dr. Dean, Muscatine; Dr. Wright, Carroll; Dr. Kersey, Stuart; Dr. Thomas Walnut, secretary, who together with the faculty, passed upon the qualifications of students.

T. S. Johnson delivered the valedictory for the class, and Dr. W. F. Peck, dean, delivered the address for the faculty.

THE Alumni Association of Cook County Hospital Internes held its annual reunion at the Tremont House, February 23d. The association now contains more than forty names on its membership roll, though not more than half that number were present. One or two members of the medical board were also present. Dr. Fox of Milwaukee, the president, was unavoidably detained at the eleventh hour, and Dr. Strong was made chairman for the evening. The usual routine business was transacted, letters of regret from absentees read, and Dr. Gephart of Kansas elected president for the ensuing year. A bountiful repast was served in the ladies' ordinary, and the alumni finally adjourned amid a cloud of smoke at a late hour.

ROSWELL PARK, *Permanent Secretary.*

AMERICAN MEDICAL ASSOCIATION.

PHILADELPHIA, 1400 PINE STREET,
Southwest corner Broad.

The thirty first annual session will be held in the city of New York, on Tuesday, Wednesday, Thursday and Friday, June 1, 2, 3 and 4, 1880, commencing on Tuesday at 11 a. m.

"The delegates shall receive their appointment from permanently organized State Medical Societies, and such County and District Medical Societies as are recognized by *representation in their respective State Societies*, and from the Medical Department of the Army and Navy of the United States."

"Each State, county and district medical society entitled to representation shall have the privilege of sending to the association one delegate for every ten of its regular resident members, and one for every additional fraction of more than half that number; *provided*, however, that the number of delegates for any particular State, territory, county, city, or town shall not exceed the ratio of one in ten of the resident physicians who may have signed the code of ethics of the association."

Secretaries of medical societies as above designated are earnestly requested to forward, *at once*, lists of their delegates.

SECTIONS.—"The chairman of the several Sections shall prepare and read in the general sessions of the association, papers on the advances and discoveries of the past year in the branches of science included in their respective Sections. * * *"—BY-LAWS, Art. II. Sec. 4.

Practice of Medicine, Materia Medica and Physiology.—Dr. J. S. Lynch, Baltimore, Md., *Chairman;* Dr. W. C. Glasgow, St. Louis, Mo., *Secretary.*

Obstetrics and Diseases of Women and Children.—Dr. Albert H. Smith, Philadelphia, Pa., *Chairman;* Dr. Robert Battey, Rome, Ga., *Secretary.*

Surgery and Anatomy.—Dr. W. T. Briggs, Nashville, Tenn., *Chairman;* Dr. C. Powell Adams, Hastings, Minn., *Secretary.*

Medical Jurisprudence, Chemistry, Pyschology, State Medicine and Public Hygiene.—Dr. Jas. F. Hibberd, Richmond, Ind., *Chairman;* Dr. Thos. F. Wood, Wilmington, N. C., *Secretary.*

Ophthalmology, Otology, and Laryngology.—Dr. Bolling A. Pope, New Orleans, La., *Chairman;* Dr. Eugene Smith, Detroit, Mich., *Secretary.*

The following committees are expected to report:

On Prize Essays.—Dr. Austin Flint, New York, *Chairman.*

On Necrology.—Dr. J. M. Toner, Washington, D. C., *Chairman.*

On Catalogue of National Library.—Dr. H. C. Wood, Pa., *Chairman.*

On Ozone.—Dr. N. S. Davis, Chicago, Ill., *Chairman.*

On Metric System.—Dr. T. Parvin, Indianapolis, Ind., *Chairman.*

On State Medical Societies.—Dr. S. D. Gross, Philadelphia, *Chairman.*

To be acted upon:

Changes in By-Laws proposed by Committee on the Address of the President.

1. Expunge from Section III everything relating to Prize Essays, and the Committee on Prize Essays.

2. Introduce into Section II the following laws:

Prize Essays.

(*a.*) There shall be four annual prizes of two hundred and fifty dollars each, which shall be awarded at the close of the second year after announcement, as hereinafter explained, for strictly original contributions to medical and surgical progress.

(*b.*) It shall be the duty of the chairman of each of the following four Sections: 1. Practical Medicine, Materia Medica, and Physiology; 2. Obstetrics and Diseases of Women and Children; 3. Surgery and Anatomy; 4. State Medicine and Public Hygiene, to appoint annually before the adjournment of the meeting of the Association three members of ability and good judgment, who shall constitute a Committee of Selection, and who shall, within thirty days thereafter, select and publicly announce for competitive investigation and report, a subject belonging to one or other of the branches of medicine included in the title of the Section.

(*c.*) It shall also be the duty of the chairman of each of the Sections mentioned to appoint annually a Committee of Award,

consisting of three experts, who shall carefully examine the essays offered for competition, and if any one shall be found worthy of the prize as a substantial contribution to medical knowledge, to recommend the same to the Association.

(*d.*) All essays placed by their authors for competition shall be in the hands of the chairman of the respective Committees of Award on or before the first day of January preceding the meeting of the Association at which the reports of the committees are required to be made.

(*e.*) All Prize Essays shall be considered as the property of the Association.

(*f.*) The names of the authors of the competing essays shall be kept secret from the committees by such means as the latter may provide.

(*g.*) Membership in either of the two committees shall not debar from membership in the other; nor shall membership in the Committee of Selection exclude a member from the privilege of offering a competing essay.

Amendments proposed by DR. JOHN H. RAUCH.

AMENDMENT TO THE CONSTITUTION.

Article II., second paragraph, after "Army and Navy" insert "and the Marine Hospital Service of the United States."

Article II., fourth paragraph, at the end insert "the Marine Hospital Service of the United States shall be entitled to one delegate."

Will you kindly send to the undersigned a list of your members, with their residences, in order that a correct record may be made of all who are in affiliation with this body?

W. B. ATKINSON,
Permanent Secretary.

ILLINOIS STATE MEDICAL SOCIETY.—The next regular annual meeting of this Society will be held in Belleville, Ill., commencing on the morning of the *third Tuesday* in May. The local Committee of Arrangements are making all needed arrangements for a good meeting. The following committees are expected to report:

Committee of Arrangements.—Drs. T. B. Moore, Belleville; Washington West, Belleville; T. M. Armstrong, Madison Co.; Wm. R. McKenzie, Randolph Co.; H. Z. Gill, Jerseyville.

Committee on Practical Medicine.—W. S. Caldwell, Warren; F. B. Haller, Vandalia; J. S. Whitmire, Metamora.

Committee on Surgery.—W. Hill, Bloomington; A. C. Rankin, Loda; J. G. Harvey, Grove City.

Committee on Obstetrics.—G. W. Nesbitt, Sycamore; E. L. Herriott, Grafton; I. W. Fink, Hillsboro.

Committee on Gynæcology.—T. Davis Fitch, Chicago; J. Y. Campbell, Paxton; L. H. Corr, Carlinville.

Committee on Ophthalmology.—W. T. Montgomery, Chicago; J. M. Everett, Dixon; J. P. Johnson, Peoria.

Committee on Drugs and Medicines.—C. B. Johnson, Champaign; Jehu Little, Bloomington; Thos. Whitten, Irving.

Committee on Necrology.—T. F. Worrell, Bloomington; G. W. Albin, Neoga; E. Ingals, Chicago.

Vacancies in Judicial Council.—F. B. Haller, Vandalia; E. Ingals, Chicago; M. W. Walton, Ridott.

Committee on State Register.—E. P. Cook, Mendota; F. L. Matthews, Springfield; D. S. Booth, Sparta.

SPECIAL COMMITTEES.

Committee on Croup.—H. Z. Gill, Jerseyville.

Committee on Diseases of Children.—Chas. W. Earle, Chicago; M. W. Walton, Ridott.

Committee on Pelvic Cellulitis (Parametritis).—P. L. Dieffenbacher, Havana.

Committee on Pneumonia.—J. Maclay Armstrong.

Committee on Antiseptic Surgery.—Edwin Powell, Chicago.

Committee on Abnormal Thermal Conditions in Diseases, and the Means of Controlling Them.—J. H. Hollister, Chicago.

APROPOS of the interesting paper on monsters, which appears in another column, it is reported in a medical publication foreign to this city, that a new institution is to be established here, to be called the Union College of Medicine, with a faculty to be composed of representatives of all the 'pathies! Monstrum horrendum!

ANNOUNCEMENTS FOR THE MONTH.

SOCIETY MEETINGS.

Chicago Medical Society—Mondays, April 5 and 19.

West Chicago Medical Society—Mondays, April 12 and 26.

CLINICS.

MONDAY.

Eye and Ear Infirmary—2 p. m., Ophthalmological, by Prof. Holmes; 3 p. m., Otological, by Prof. Jones.

Mercy Hospital—2 p. m., Surgical, by Prof. Andrews.

Rush Medical College—2 p. m., Dermatological and Venereal, by Prof. Hyde; 3 p. m., Medical, by Dr. Bridge.

Woman's Medical College—2 p. m., Dermatological and Venereal, by Prof. Maynard; 3 p. m., Diseases of the Chest, Prof. Ingals.

TUESDAY.

Cook County Hospital—2 to 4 p. m., Medical and Surgical Clinics.

Mercy Hospital—2 p. m., Medical, by Prof. Hollister.

WEDNESDAY.

Chicago Medical College—2 p. m., Eye and Ear, by Prof. Jones.

Rush Medical College—3:30 to 4:30 p. m., Diseases of the Chest, by Dr. E. Fletcher Ingals.

THURSDAY.

Chicago Medical College—2 p. m., Gynæcological, by Prof. Jenks.

Rush Medical College—3 p. m., Diseases of the Nervous System, by Prof. Lyman.

Eye and Ear Infirmary—2 p. m., Ophthalmological, by Dr. Hotz.

Woman's Medical College—3 p. m., Surgical, by Prof. Owens.

FRIDAY.

Cook County Hospital—2 to 4 p. m., Medical and Surgical Clinics.

Mercy Hospital—2 p. m., Medical, by Prof. Davis.

SATURDAY.

Rush Medical College—2 p. m., Surgical, by Prof. Gunn.

Chicago Medical College—2 p. m., Surgical, by Prof. Isham; 3 p. m., Neurological, by Prof. Jewell.

Woman's Medical College—11 a. m., Ophthalmological, by Prof. Montgomery; 2 p. m., Gynæcological, by Prof. Fitch.

Daily Clinics, from 2 to 4 p. m., at the Central Free Dispensary, and at the South Side Dispensary.